PRECLINICAL AND COMPARATIVE CLINICAL TRIAL OF THETRAN ILAGAM (INTERNAL) AND YOGAM THERAPY IN THE MANAGEMENT OF AAN MALADU (MALE INFERTILITY)

The dissertation submitted by

Dr. S. KARTHIK NAGARAJAN

Under the Guidance of

Dr. N.J.MUTHUKUMAR, M.D. (S)

HOD i/c &Guide, Department of Sirappu Maruthuvam

Dissertation Submitted to

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

CHENNAI-32

In partial fulfillment of the requirements
For the award of the degree of

DOCTOR OF MEDICINE (SIDDHA)
BRANCH III-SIRAPPU MARUTHUVAM
2015-2018

NATIONAL INSTITUTE OF SIDDHA
(The Ministry of AYUSH-Govt.of India)
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DECLARATION BY THE CANDIDATE

I hereby declare that this dissertation entitled "Preclinical and Comparative Clinical Trial of Siddha drug Thetran Ilagam (Internal) and Yogam therapy in the Management of Aan Maladu (Male infertility) is a bonafide and genuine research work carried out by me under the guidance of **Dr.N.J.Muthukumar,M.D(s),** Associate Professer & HOD (i/c)**,** Department of **Sirappu Maruthuvam**, National Institute of Siddha, Chennai -47, and the dissertation has not formed the basis for the award of any Degree, Diploma, Fellowship or other similar title.

Date: **Signature of Canditate**

Place: **Dr.S.Karthik Nagarajan**

BONAFIDE CERTIFICATE

Certified that I have gone through the dissertation submitted by **Dr.S.Karthik Nagarajan, (Reg.No: 321513202)** a student of final year M.D(s), Branch-III,Department of **Sirappu Maruthuvam**, **National Institute of Siddha**, Tambaram Sanatorium, Chennai-47, and the dissertation work has been carried out by the individual only. This dissertation does not represent or reproduce the dissertation submitted and approved earlier.

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Tambaram Sanatorium
Chennai-47

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CONTENTS

CONTENTS

INTRODUCTION

கடவுள் வணக்கம்:

"கடையிலா ஞானத்தோடு காட்சிவீரிய மேயின்பம்
மிடையுரு நாமமின்மை விதித்தகோத்திரங்களின்மை
அடைவிலா வாயுவின்மை யந்தராயங்களின்மை
உடையவனிறைவனென்னவுரைக்கு மாருகத நூலே"[1]

- சூடாமணி நிகண்டு பாடல்-85 பக்கம் எண்370

INTRODUCTION:

The siddha system of medicine is one of the ancient systems contemporaneous with those of the submerged lands, Egyptian, Mesopotamian, Chinese and Grecian medicines. The unique nature of this system is its continuous service to humanity for more than five thousand years[2].Tamil nadu the home of the siddhar was a vast continent several million of year ago [3]. "Siddhargal" or Siddhars were the premier scientists of ancient days. Siddhars, mainly from Southern India laid the foundation for this system of medication [4]. There were 18 important Siddhars in olden days and they developed this system of medicine. Hence, it is called Siddha medicine. The word Siddha comes from the word Siddhi which means an object to be attained perfection or heavenly bliss[5].

Siddha medicine means medicine that is perfect. Siddha medicine is claimed to revitalize and rejuvenate dysfunctional organs that cause the disease and to maintain the ratio of *mukkutram Vaatham*, *Pitham* and *Kabam*. According to the Siddha medicine, various psychological and physiological functions of the body are attributed to the combination of sevenelements:

- First is ***saaram*** (plasma) responsible for growth, development and nourishment;
- Second is ***senneer***(blood) responsible for nourishing muscles, imparting color and improvingintellect;
- The third is ***oon***(muscle) responsible for shape of thebody;
- Fourth is ***kozhuppu*** (fatty tissue) responsible for oil balance and lubricatingjoints;

- Fifth is ***elumbu*** (bone) responsible for body structure and posture and movement;
- Sixth is ***moolai*** (bone marrow) responsible for formation of blood corpuscles;
- And the last is ***sukkilam/suronitham*** (sperm/ova) responsible for reproduction

It is assumed that when the normal equilibrium of the three humors (Vadham, Pitham and Kabam) is disturbed, disease is caused. The factors, which assumed to affect this equilibrium, are environment, climatic conditions, diet, physical activities, and stress. Under normal conditions, the ratio between these three humors i.e.: (Vadham, Pitham, Kabam) 1:1/2: ¼ respectively [6].

The siddha medicine given to Herbal products, Inorganic substance and Animal products (thavara, thathu, sangama things).The drugs used in siddha medicine were classified on the basis of five properties

- *Suvai* (taste),
- *Gunam*(character),
- *Veeryam*(potency),
- *Pirivu*(class)
- And *Mahimai*(action).

According to their mode of application, the siddha medicines could be categorized into two classes [6]:

- *Internal medicine* was used through the oral route and further classified into 32 categories based on their form, methods of preparation, shelf-life,etc.

- *External medicine* includes certain forms of drugs and also certain applications (such as nasal, eye and ear drops), and also certain procedures (such as leech application). It also classified into 32 categories.

According to the siddha medicine system, diet and lifestyle play a major role, not only in health but also in curing diseases. This concept of the siddha medicine is termed as pathiyam and apathiyam, which is essentially a list of "do's and don'ts"[7].

The art of living depends upon several factors including maintenance of heredity with healthy progeny. Healthy progeny depends upon healthy gametes from both male and female partners of conjugated life style.

Infertility bears a social stigma. According to The World Health Organization (WHO)estimatesthat60to80millioncouplesworldwidecurrentlysufferfrominfertility[8]. Infertilityvariesacrossregionsoftheworldandisestimatedtoaffect8to12percentof couples worldwide [9][10]. It means failure of a couple to become parent after one year of successful married life. Male infertility is commonly due to deficiencies in the semen, and semen quality is used as a surrogate measure of malefecundity.[11]

Male infertility is a vexing clinical problem. The incidence of male infertility varies in different region. The incidence of infertility among males 40%, females 40%, both sex 20%[12].

To Generate new knowledge on Siddha Andrology to fertility regulation and Endocrine disorders ancient Siddha literatures describes many safe and effective drugs identified by Siddhars for thousands of years.

In our Siddha System of Medicine According to Thirumoolar Yogam (Asanams)Asanam(Yogam) one of the Astaanga yogam .Yogasanam to fight all the emotional and psychological traumas by proving a calm and peaceful state of health ,which ultimately boosts well-functioning of reproductive system.

A quiet,stable mind and body promotes fertility.There are certain yogasanam that especially target the reproductive organs and the pelvic area.

Men are subject to infertility problems like low sperm count ,which is quiet often related to high stress levels.Regular Yogam practice helps release stress and most importantly yoga can help regain sexual stamina.So I am eager to conduct a successful clinical study in THETRAN ILAGAM (INTERNAL) and YOGAM THERAPY for Aanmaladu (Male infertility)

AIM & OBJECTIVE

AIM & OBJECTIVE

AIM:

- To evaluate the therapeutic efficacy of Thetran Ilagam and Yogam therapy in the Aan maladu (Male infertility) .

OBJECTIVE:

- To evaluate the therapeutic efficacy of *Thetran Ilagam*in *Aan maladu* (Male infertility) to increase the sperm concentration, viscosity of semen and to reduce premature ejaculation, nocturnal emission in AANMALADU.
- To evaluate the safety profile of the trial drug *Thetran Ilagan*
- To collect the authorized measures and review the ideas of Aan maladu in Siddha and modernliteratures.
- To have an idea about the relation of the disease with **age, habits, occupation, economic states, family history and climaticconditions.**
- To expose the efficacy of siddhars diagnostic principles such as mukkutram, envagai thervugal, eazhu udalthadhukkal, neerkuri and neikkuri.
- To have detailed clinicalinvestigations.
- To have a clinical trial on the disease **"*AAN MALADU*"** with the siddha herbal formulation of "***THETRAN ILAGAM***".
- Toevaluate the,

  Toxicity study [acute & sub-chronic]
  Sexual Health Score
  Yogam therapy
  Bio –statistical analysis
- To handle the modern parameters to confirm the diagnosis and prognosis of thestudy.

REVIEWOFLITERATURE

SIDDHA ASPECT

REVIEW OF LITERATURE

SIDDHA ASPECT

கரு உற்பத்தி விளக்கம்

பிண்டோற்பத்தியில் ஐம்பூதங்களின் சேர்க்கை

FORMATION OF FETUS COMBINES WITH PANJABOOTHAM:

"உன்னிய கர்ப்பக் குழியாம் வெளியிலே
பன்னிய நாதம் பகர்ந்து பிருதிவி
வன்னியும் வாயுவும் மாயுறுஞ் சுக்கிலம்
மன்னிய சமனாய் வளர்க்குமுதகமே"[13]

-திருமூலர் கருக்கிடை வைத்தியம் 600, பாடல் எண்:14, பக்க எண்: 5
-நோய் நாடல் நோய் முதல் நாடல் திரட்டு பகுதி-1, பக்க எண்:30-31

என்ற திருமூலர் கருத்துப்படி

கருக்குழியை -ஆகாயமாயும்
நாதம்- பிருதிவியாயும்
சுக்கிலம்- வன்னி வாயுவாகவும் பாவித்து

கருவளர்வதற்கு இடமளிப்பது கருப்பை எனவும் கருவைத் தோற்றுவித்து அதற்கு உணவை அளிப்பது நாதம் எனவும் வளர்ச்சிக்கு வேண்டிய சூட்டையும் வாயுவையும் விந்து பெற்றுளது எனவும் இது சூட்டையும் வாயுவையும் நாதத்திற்குத் தந்து தொழில் புரிவதால் நாதம் கருவாக வளரமுடிகின்றது.[14]

The ovum consists of the element earth, whereas the sperm consists of fire and air, the uterine wall nourishes it has water and uterine cavity is one of the element of space. Therefore in the formation of fetus all the five elements combine and create it.

DETERMINATION OF GENDER OF EMBRYO:

"ஆண்மிகி லாணாகும் பெண்மிகிற் பெண்ணாகும்
பூணிரண் டொத்துப் பொருந்தில் அலியாகும்" [15]

-திருமந்திரம் (478), பக்க எண்:211

-நோய் நாடல் நோய் முதல் நாடல் திரட்டு பகுதி-1, பக்க எண்:32

ஆண் பெண் கூடும்போது ஆணுக்குப் பெண்மீது அதிக அன்புண்டாகில் தரிக்கும் கரு ஆண் எனவும் பெண்ணுக்கு ஆண் மீது அதிகம் அன்புண்டாகில் தரிக்கும் கரு பெண் எனவும் இரண்டும் சமமாகில் அலியாகவும் பிறக்குமென்பர் திருமூலர்[14]

At the time of copulation if the male dominates then it is male, if the female dominates then it is female, if the male and the female are equal then the child was intersex gender or an eunuch.

"நிறையான வலத்தோடில் ஆணே யாகும்
நேராக மிடத்தோடிற் பெண்ணே யாகும்"

-பதினெண்சித்தர்கள் பாடிய சில்லறைக் கோவை 1ம் பாகம் பக்க எண் 25
-நோய் நாடல் நோய் முதல் நாடல் திரட்டு பகுதி-1, பக்க எண்:32

கருத்தரிப்பதற்ரிய நாதமும் விந்துவும் கலக்கும்காலத்தில் ஆண் பெண் இருவருக்கும் சரம் என்னும் பிராணவாயு வின் இயக்கமானது வலது நாசியில் போய்கொண்டிருப்பின் பிறக்கப்போகும் குழந்தை ஆண் எனவும் இடது நாசியில் ஓடில் பெண் எனவும் உபாயமாகச் சுழிமுனையிலோடில் அலியாகவும் பிறக்குமென நூல்கள் கூறுகின்றன[14] [16].

THE ROLE OF VAAYUS IN FERTILIZATION:

"வேர்க்கவே வேலிபோல் வளைந்து காக்கும்
விந்துவுடன் பிராணவாயு விளக்கலாமே"

-பதினெண்சித்தர்கள் பாடிய சில்லறைக் கோவை 1ம் பாகம் பக்க எண் 28

-நோய் நாடல் நோய் முதல் நாடல் திரட்டு பகுதி-1, பக்க எண்:34

Abanan stays outside the zygote and protect it. The pranan goes along with spermatozoa and bisects the size of the zygote [14][17] .

REASON FOR MALADU IN SIDDHA LITERATURE:

"பெண்ணின் பாலிந்திரியம் விடும்போதெல்லாம்
பேணிவலம்மேல் நோக்கி அவற்றில் நில்லு"[18]

-பதினெண்சித்தர்கள் பாடிய சில்லறைக் கோவை 1ம் பாகம் பக்க எண் 10

பெண்ணுக்கு மனது வேறாய் மௌனமின்றேல் மலடாவாள் அதே மாதிரி புருடருக்கு முண்டு.

-நோய் நாடல் நோய் முதல் நாடல் திரட்டு பகுதி-1, பக்க எண்:31

ஆண் பெண் கலவின்போது அவர்களது ஞானேந்திரியம், கருமேந்திரியம், மனசு ஆகிய இப்பதினொன்று தத்துவங்களும் ஒன்று கூடிய சமயம் ஆணும் பெண்ணும் மௌனமாயிருத்தல் அவசியம். அதாவது ஆண் பெண் கலவியில் சுக்கில சுரோணிதங் கலக்கும் காலத்தில் இத்தியாதி ஒன்றுபட்ட நேர்மையுடன் மௌனம் அவசியம்[14].

“முறையாகப் பெண்ணாணு மௌனமுற்றால் மோசமில்லை கருவாங்கே தரிக்கும்பாரு”

“தானென்ற பதினொன்றாற் சடந்தான் முன்னே
சாதகமா யெடுத்துவரு மலடெவ் வாறு?
ஊனென்ற பெண்ணுக்கு மனது வேறாய்
உருதமுற்று மௌனவொண்ணாப் பாவத் தாலே
கானென்ற மலடாவாள் புருட ருக்குக்
கைமுறையா யிப்படித்தான் கண்டு கொள்ளே”[19]

-பதினெண்சித்தர்கள் பாடிய சில்லறைக் கோவை 1ம் பாகம் பக்க எண் 15

-நோய் நாடல் நோய் முதல் நாடல் திரட்டு பகுதி-1, பக்க எண்:31-32

According to agathiyar uyar gnanam, at the time of copulation the following 11 principle‟ s (the five organs of action, the five organs of perception, and soul) tobe concentrated by both thepartners[14].

“அண்டத்தி லுள்ளதே பிண்டம்
பிண்டத் திலுள்ளதே அண்டம்
அண்டமும் பிண்டமு மொன்றே
அறிந்துதான் பார்க்கும் போட்தே”

-சட்டமுனி ஞானம்
-சித்த மருத்துவாங்கச் சுருக்கம், பக்கம் எண்.49

In these forces may act in an abnormal manner and cause diseases thereby. Similarly, in the great organisms of the cosmos, they may act abnormally likewise and bring about diseases on earth and its atmospheric conditions such as earthquakes, storms, lightning, and rain-falls resulting in floods or inundations and so on. Again, the quality of life found in the elements constituting the blood of man corresponds to the quality of the invisible influences radiating from mars. If the soul- essentials that characterize the influences of Venus do not exist, **the natural instincts that cause men and animals to propagate their species** would cease to operate; because all beings in the universe are sympathetically connected with the only one universal principle of life from Venus resulting in love between two people of the oppositesex[20][21].

AAN MALADU

ஆண் மலடு:

அப்பனே பெண்மலடு யாருமில்லை”
[22][23]
"பாரப்பா பெண்மலடாம் கர்ப்பக் கோணின்
பக்குவத்தை சொல்கிறேன் பண்பாய் கேளு
ஆரப்பா ஆண்மலடே யாருமல்லா மல்

SUKKILA VATHAM: -ஆத்மரட்சாமிதமென்னும் கெர்ப்பக்கோள், பக்க எண்-36

-பதினெண்சித்தர்கள் பாடிய சில்லறைக் கோவை 1ம் பாகம் பக்க எண் 3-4

சுக்கில வாதம்:

“வாதமா முடலுருகி மிகவும் வற்றி
மலமூத்திரம் சிக்கியே கீழ்விழாமல்
நாதமாம் நாக்கொடுமூக்கு தன்னில்

நுணுக்கமாம் வுதிரம்தானருவி பாயும்
சேதமாம் சேட்டுமம் கோழையுண்டாஞ்
செயலொடு சுவாசமாம் யருசி யுண்டாஞ்
சூதமாய் சுக்கிலந்தான் ருன்னி யாகுஞ்
துரிய சுக்கில வாதம் சூட்சந்தானே.” [24]

- யூகி முனி, யூகி வைத்திய சிந்தாமணி 800 பக்க எண் 115

-நோய் நாடல் நோய் முதல் நாடல் திரட்டு பகுதி-2, பக்க எண்:574

Emaciation, constipation, oliguria, bleeding from the nose, phlegm accumulation due to increased kapham, breathlessness, loss of taste. All the symptoms are associated with affected sukkilam, according to yugi[25].

சுக்கில வாதம்:

“வாயு வாதம் காற்றினிடை வந்தால் அவயங்கள்
பாயும்கால் வலிக்கும் பண்ணுகுணம்- காயத்தின்
சுக்கிலக் காலந்திரத்திற் துன்று துரித மின்னம்
புக்கி நிறத்தாது கெட்டுப்போம்.” [26]

-அகத்தியர் வைத்திய சிந்தாமணி வெண்பா-4000 பாகம்-1.பக்கம்-60

AAN MALADU:

According to T.V.Sambasivam pillai dictionary, The semen in such cause was devoid of sweetness and life and float on the surface of water. The urine also was frothy. Such man is incapable to impregnate women[27].

-T.V.Sambasivam pillai dictionary page no 345.

FORMATION OF VINDHU (SEMEN):

விந்துற்பனம் (விந்துவின் தோற்றம்):

சக்த்தின் தோற்றத்திற்க்கு மூலமான சுத்தம் முதலான மாயையினின்று விரியும் வகையும் விண்டத்தில் விந்துவினின்று புணர்ச்சியாகிய காரியத்தான் கரு உருக்கொள்ளுமாறுயாண்டு அண்டம் பிண்டம் இவற்றை இணைத்தே கூறுவராதலின் ஈண்டும் சில மந்திரங்களான அண்ட நிலைக்கு அடியான பர அபர விந்துவின் வெளிப்பாட்டையும், பிண்டத்திற்குக் காரணமான கரு விந்துவின் தோற்றத்தையும் உணர்த்துகிறார்

"உதயத்தில் விந்துவில் ஒங்கு குண்டலியும்
உதய குடிலில் வயிந்தவம் ஒன்பான்
விதியில் பிரமாதி கள்மிகு சக்தி
கதியிற் கரணங்கலைவை கரியே"![28]

- திருமூலர் திருமந்திரம் (1923) பக்கம்.எண். 834

"அழிகின்ற விந்து அளவையறியார்
கழிகின்ற தன்னையுட் காக்கலுந் தேரார்
அழிகின்ற காயத் தழிந்தயர் வுற்றோர்
அழிகின்ற தன்மை யறிந்தொழியாரே"[29]

- திருமூலர் திருமந்திரம் (1936) பக்கம்.எண். 839

According to siddhars 1 drop of venner made from 80 drops of senner (blood). 1drop of vindhu made from 80 drops of venner. So 6400 drops of senner (blood) needed to make one drop of vindhu[30].

- உடல் தத்துவம் பக்கம்.எண். 176

AAN MALADU GUNAM:

ஆண்மலடு குணம்:

"பார்க்கவேஆண்மகனின் விந்து தானும்
பதமான தித்திப்பு யில்லாததாலும்
ஏர்க்கவே சல மீதில் மிதந்தாலும்
எழிலாக உயிர்ப்பற்றுயி ருந்தாலும்
சேர்க்கவே மூத்திரத்தில் நுரைதான் போலும்
செயலான கருவதுவும் தரிக்கமாட்டா"[31].

- யூகி முனி,
-மகளிர் மருத்துவம் பக்கம்-96

யூகி முனிவர் கூற்றுப்படி,

1.விந்துவை நீரிலிட மிதந்தாலும்

2.இனிப்புச் சுவையில்லாமலும்

3.உயிர்ப்பில்லமல் இருந்தாலும் புணர்ச்சியுரினும் கருத்தரிக்கமால் இருக்கின்ற குறிகுணங்களைக் கொண்ட செய்கைக்கு ஆண் மலடு என்று பெயர்[31].

ஆண்மலடின் தன்மை

"கூறினார் புருஷருட விந்து தானும்
குணமக தித்திப்பு இல்லாத்தாலும்
மீறியதோர் சலமீது மிதந்தாலும்
மிகவாக உயிரற்று இருப்பதாலும்
சீறியதோர் மூத்திரத்தில் நுரைதான் போலும்
சிறப்பான கருவதுதான் தரித்திடாது
தேறியதோர் மங்கையர்கள் மலடே யாவாள்
தெளிவான ஆண்மலடின் தன்மைதானே"[32].

-அரிவையர் சிந்தாமணி, பக்க எண்:153

According to yugi and arivaiyar sinthamani

- Lack of sweetness insemen
- Buoyancy onwater
- Absence ofvirility
- Frothymaturation

The above told character of semen mainly contributes infertile man.

AETIOLOGY:

திருமூலர் கூறும் நோய் காரணம்:

"ஓரெட்டுச் சன்னி உழண்டது பெண்ணுக்கும்

வாரெட்டுஆணுக்கும் மகத்தாம் சுகசன்னி

நேரிட்டுப் பார்க்கில் நிகழ்ந்தது வெவ்வேறு

பாரெட்டு மெய்ச்ச பகுத்த முறைபாரே"[33].

-திருமூலர் கருக்கிடை வைத்தியம் 600, பாடல் எண்:37

பொருள் விளக்கம்:

பெண்களுக்கு 8 வகை சன்னியாலும்,ஆண்களுக்கு சுக சன்னிமுதற்கொண்ட பலவகை சன்னியாலும் கர்ப்பம் வாய்க்காமல் போகும்[33].

MALE INFERTILITY DUE TO INFECTIONS:

கரும்பனிசையம்மை :

"அறிந்தபின் இவர்களுட நப்பா
அந்தந்த சரீ ரத்திற் கடுத்த வாராய்
தெரிந்ததொரு குணக்குறிகள் தோன்றுமப்பா
திறமான கருன்பனிசை விந்தைக் கொல்லும்
பரிந்த்தொரு கர்ப்பத்தை அழியப் பண்ணும்
பண்பாக யவர்களுக்கு பிள்ளை யில்லை" [34][35]

-பதினெண்சித்தர்கள் பாடிய சில்லறைக் கோவை 1ம் பாகம் பக்க எண் 35
- நோய் நாடல் நோய் முதல் நாடல் திரட்டு பகுதி -2, பக்க எண்:66

கரும்பனிசை அம்மையால் பாதிதவர்க்கு விந்துவும்,கருப்பமும் அழியும் எனவும்,பெரும்பாலும் மலடாகவே இருப்பார்களெனவும் அகத்தியர் வைசூரி நூலில் கூறப்பட்டுள்ளன.

கரும்பனிசை அம்மையின் பாதிப்பு:

ஆண்களில் விந்தணு உயிரிழப்பும்,பெண்களில் கருச்சிதைவும் உண்டாக்கும்.இதனால் ஆண்,பெண் இருவரிழும் மலட்டுதன்மையை உண்டாக்கும்

The complications of the karumpanisai ammai are,

-Death of sperm cells inmale
-Abortion in pregnantwomen
-Produce sterility in both men and women[35].

MALE INFERTILITY DUE TO TRAUMATIC LESIONS:

1.கல்லிடைகாலம்(அண்ட வர்மம்,பீச காலம்)-

அடிபடுவதால் வர்ம குறிகுணம்:

விதை இரண்டும் காணாது. விதை ஏறிக்காணப்படும்.வர்மம் அதிகமானால் ஆண் குறி பலனற்று போகும். நீர் பிடிக்கும்.விதை மேலேறிய பகுதியில் சதை வளர்ந்து மூடும்[36].

-வர்ம மருத்துவம் சிறப்பு பக்க எண் 260

2.உச்சி பதப்பு காலம்-

அடிபடுவதால் வர்ம குறிகுணம்:

கொண்டை குழைந்து போகும்.விந்து வெளிப்படும்.ஸ்திரி போகம் குழைந்து போகும்.சன்னி,சீதம் வந்து சேரும்[37].

-வர்ம மருத்துவம் சிறப்பு பக்க எண் 80

DIAGNOSTIC METHODS IN SIDDHA SYSTEM:

UDAL KATTUGAL: (SEVEN PHYSICAL CONSTITUENTS)

1. SAARAM – CHYLE (PLASMA):

It is responsible for the growth & development. It keeps the individual in good spirit and nourishes the blood.

In Aan Maladu, Saaram affected.

2. SENNEER –BLOOD:

Blood imparts color to the body and nourishes the muscle for the ability.

3. OON –MUSCLE:

Gives shape to the body.

4. KOZHUPPU –FAT:

It helps in lubricating the different organs and maintains oily matter of the body.

5. ENBU –BONE:

It supports the system and responsible for the posture movement of the body.

6. MOOLAI –MARROW:

It fills the bone cavity, nourishes semen and imparts strength, endurance and shiny appearance.

7. SUKKILAM(SPERM):

It is responsible for the reproduction[38].

- நோய் நாடல் நோய் முதல் நாடல் திரட்டு பகுதி -1, பக்க எண்:255-258

In Aan Maladu, Sukkilam affected.

At the time of copulation, the semen is ejaculated. The prostatic fluid gives the semen a milky appearance. In the early minutes after ejaculation, the sperm remains immotile, possibly because of the viscosity of the coagulum. As the coagulum dissolves the sperm become highlymotile.

At the time of copulation insufficient quantity of semen is ejaculated with pain, pricking pain in the scrotum, irritation of thepenis[40].

- நோய் நாடல் நோய் முதல் நாடல் திரட்டு பகுதி -1, பக்க எண்:258

இந்திரிய பரிட்சை:

“ஐய மலை பால்மோர் தேனாச் சியங்கலா கம்மிவையை
யையமளை யாதறிந்து கொள்ளுவா யையமளை
யுத்தமத்தை முன்னேருன யிந்திரிய பரிட்சை
யுத்தமத்தை நூலா தரையோர்”[41].

-தேரன் யமக வெண்பா பக்க எண்.86

Examine the semen:

If the semen is,

1. White and akin to the butter, it isexcellent.
2. White and akin to curd, it is verygood.
3. White and akin to the milk, it isgood.
4. White and akin to the butter milk, it isfair
5. Akin to the honey in color and consistency, it isaverage.
6. Akin to the ghee in color and weight, it ispoor.
7. Akin to the toddy is color and weight, it is verypoor.
8. Akin to the water, it is verybad[42].

- நோய் நாடல் நோய் முதல் நாடல் திரட்டு பகுதி -1, பக்க எண்:280-281

சுக்கிலத்தை அடக்கினால் உண்டாகும் நோய்கள் :

“சுக்கில ந்தனை அடக்கின்
சுரமுடனீர்க் கட்டாகும்
பக்கமாய் கைகால் சந்து
பாரமாய் வழி இறங்கும்
மிக்க மார் நோயுண்டாகும்
மிகுந்திடும் பிரமேகந்தான்
தக்கதோர் போதுமாகின்
”[43].

- உடல் தத்துவம் பக்கம்.எண்-337

Uyir thathukkal / Mukkutram:

These are all the main three pillars which functioning the body with an equilibrium state. Any disturbance in that state leads to diseased condition in our body.

The three pillars are,

1. Vali
2. Azhal
3. Iyam

1. Vali or Vaayu:

Vali is not mere wind, but also that which causes motion, energy and sensation of every cell in the body. Vaayu relates to nerve force. It is responsible for all movements in the mind and the body. In human body it controls the Gnanendriyam (sensory actions) & Kanmendriyam (motor activities)

Vali generally lives in,

Abanan, Edakalai, Kamakodi, Undhiyin Keezh Moolam, Hip region, Bones, Muscles, Nerves, Joints, Skin, Hair follicles, Stools.

Varieties of Vali:

According to their location and functions they are classified into 10 types.

1. Uyirkkaal (Pranan)
2. Kezhnokkum Kaal(Abanan)
3. Paravukaal(Viyanan)
4. Melnokkum Kaal(Udhanan)
5. Nadukkaal(Samanan)
6. Naagan
7. Koorman
8. Kirugaran
9. Devadhathan
10. Thananjeyan

1. Uyirkkaal (Pranan) (Heart Centre)

It regulates the respiratory, cardiac and digestive system. By joining with pingalai it forms azhal naadi. It is responsible for bio comfusion in the body.

2. Kezhnokkum Kaal (Abanan) (MooladharamCentre)

It regulates the defecation, micturition, menstruation, parturition and ejaculation. It corresponds to the pelvic plexus and the lower part of the gut.

3. Paravukaal (Viyanan) (fore headcenter)

It spreads all over the body and all nerve endings. It regulates constriction and relaxation of the voluntary and involuntary muscles. The neurological problems were due to this Vaayu. It spreads the nutrients to all over the body from the digested food.

4. Melnokkum kaal(Udhanan)

It is responsible for speech, vomiting, hiccough and sneeze.

5. Nadukkaal(Samanan):

It is responsible for digestion and it spreads the nutrients to all over the body. Joining with suzhumunai it forms the Kabha naadi. It neutralizes the other four Vaayus.

6. Naagam:

It is responsible for the intelligence and derangement of this Vaayu causes impaired memory. It helps to opening and closure of eyelids.

7. Koorman:

This is responsible for the vision, Yawning and Lacrimal secretions.

8. Kirugaran:

It is responsible for salivation, nasal secretion, hunger, sneeze, cough and concentration.

9. Devadhathan:

It is responsible for laziness and anger.

10. Thananjeyan:

It produces swelling all over the body and leaves from cranium only after the 3rd day after death. It is responsible for the decay of the body after death[44].

In Aan Maladu, Kezhnokkum Kaal & Paravukaal affected.

II.Azhal:

This is nothing but the characteristics of fire such as burning, boiling and heating etc. It corresponds to the functions so thermo genesis production of heat necessary to maintain integrity of the human circulatory system. Azhal is classified into 5 types. In mainly governs enzymes & hormones.

Azhal lives in:

Between heart & the navel, Sweat, lymph, blood, stomach, urinary bladder, saliva eye and skin

In Aan Maladu, Sathaga Pitham affected.

Name Location Function

1. Akku anal (Analagam)

Stomach, Small intestine Dissolvent& Digestive

2. Vanna eri(Ranjagam)

Liver, Spleen, Stomach Coloring, Pleasing, Gratifying

3. Attralangi(Sathagam)

Heart Effective efficient

4. Nokku Azhal (Alosagam)

Eyes seeing, consideration

5. Ollolithee(Prasagam)

Skin Complexion of the skin[44].

Iyyam:

It imparts moisture. Iyam is located in samanan semen, head, tongue, flat, bone marrow, blood, nose, chest, nerves, brain, large intestine, eyes, stomach & pancreas.

Name Location Function

1. **Alli Iyam(Avalambagam)**

   Lung supports all the others

2. **Neerpi Iyam(KiIethagam)**

   Stomach Moistens and nourishes the food

3. **Suvaikanna Iyam(Pothagam)**

   Tongue Take care of perception

4. **Niraivu Iyam(Tharpagam)**

   Head Refrigerant effect toeyes

5. **Ondri Iyam(Santhigam)**

   Joints Stability, Lubrication movements of joint[44].

- நோய் நாடல் நோய் முதல் நாடல் திரட்டு பகுதி -1, பக்க எண்:233-238

In Aan Maladu, Tharpagam & Santhigam affected.

ENN VAGAI THERVUGAL

நாடி பரிசம் நாநிறம் மொழிவிழி
மலம் மூததிரமிவை மருத்துவராயுதம்[45]

-தேரையர்

-நோய் நாடல் நோய் முதல் நாடல் திரட்டு பகுதி-1, பக்க எண்:270-271

It is the unique and special method in siddha

Envagai thervugal is the specialty of siddha diagnosis. These are the instruments for the physician to diagnose disease.

NAADI:

நோயின் நாடி:

"ஆகிய வாதமும் வாயுவும் கூடிடில்
தாகிய வெள்ளை தடையற்று மெத்தவாய்
போகிய மேனி பொருமி கருப்பேறும்
வாகிய தாது வழங்காது நஷ்டமே"[46].

-பதினெண்சித்தர் நாடி சாஸ்திரம், பக்க எண்:89

The three uyir thaadukkal felt through the pulse is called naadi

Naadi		**Vaayu**		**Uyir thathu**		**Ratio**
Edakalai	+	Abanan	-	Vatham	–	1
Pinkalai	+	Piranan	-	Pitham	–	½
Suzhumunai	+	Samanan	-	Kapam	–	¼

PARISAM:

Observations by touch, temperature, sensory impairments, masses, nodes, swelling and texture of the skin, pain, hardness, edematous and dullness shall be noted.

NAA:

Signs and symptoms in the tongue are considered here. Size, appearance, thickness, color (pigmented, mangenta) fissured (longitudinal, transverse) coated, geographical patches, oral hairy leukoplakia, candida, aphthous ulcer, sense of taste, saliva secretion.

NIRAM:

The color of skin is mainly considered here but also the change in other organs.

MOZHI:

The change in the normal sound of voice mainly uratha olli (Valithel), thazhntha olli (Melithal), physiological and mental status can also be noted during conversation.

VIZHI:

Color, warm, burning sensation, irritation, visual perception

MALAM:

Nature, quantity, color, odour, froth, consistency are noted.

MOOTHIRAM:

The urine examination is classified into two types.

NEERKKURI:

"வந்தநீர் கரி எடை மணம் நுரை எங்கலென்"[47]

-தேரன்

-நோய் நாடல் நோய் முதல் நாடல் திரட்டு பகுதி-1, பக்க எண்:282

Urine is to be observed for the following characters

- Niram(color)
- Edai (specific gravity)
- Manam(smell)
- Nurai(froth)
- Enjal(deposit)[48]

NEIKKURI:

It is an important test to assess the predominantly affected humour.

“அருந்து மாறி ரதமும் விரோதமதாய்
அஃகல் அலர்தல் அகால வூண்தவிர்தழல்
குற்றளவருந்தி வுறங்கி வைகறை
ஆடிக்கலசத் தாவியே காது பெய்
தொருமுகூர்த்தக் கலைக்குட்படு நீரின்
நிறக்குறி நெய்க்குறி நிருமித்தல் கடனே”[47][48] .

- தேரன்

-நோய் நாடல் நோய் முதல் நாடல் திரட்டு பகுதி-1, பக்க எண்:282

On the day before the urine test one should take food, consisting of all the six tastes at the regular time based on one's digestive fire; after a sound overnight sleep, urine should be collected in a glass ware and the test should be done before 90 minutes from dawn. A drop of oil is dropped at the center of urine (bowl) without any shake. It should be ensured that the Sunlight falls on it, but is not disturbed by the wind. A keen observation of the oil drop suggests the condition of the patient. If the oil drop takes the shape of a snake, it indicates Vaadha disease. If it spreads like a ring it indicates Pitha and if it stands like a pearl it indicates Kaba disease. If there is a combined shape like a ring in a snake, or snake in the ring, snake and a pearl or a pearl in the ring, it indicates combined derangement of humors. White layer starts with disturbed Azhal and eventually involves all the three uyir thathus-thus resulting in various patterns of oil spread in the urinesurface.

NOI NEEKAM (TREATMENT):

In Siddha system the main aim of treatment is not only for the removal of Physical illness but also the mental illness. Treatment is considered with prevention and improvement of the general body condition (rejuvenation) also. This is said as follows

Kappu - Prevention

Neekkam -Treatment – curative

Niraivu -Restoration –promotive

While treating the disease the following principles must be noted. So it is essential to diagnosis properly to know about the etiology, the nature of the patient, the severity of illness, the seasons and the time of the occurrence of thedisease.

LINE OF TREATMENT:

1. To bring the three Kutrams inequilibrium
2. Medicine(Internal)
3. Diet andadvise

1. TO BRING THE THREE KUTRAMS IN EQUILIBRIUM:

Since Siddha system of medicine is based on Mukkutra theory, the purgation (Kalichal Maruthuvam) was given by for the vitiation of three humours. Agasthiyar Kuzhambu 65mg was administrated at early morning as a purgative in the prior day of treatment.

மருந்துகள்:

உள் மருந்து : தேற்றான் இளகம்

அளவு : 5 கிராம், இருவேளை

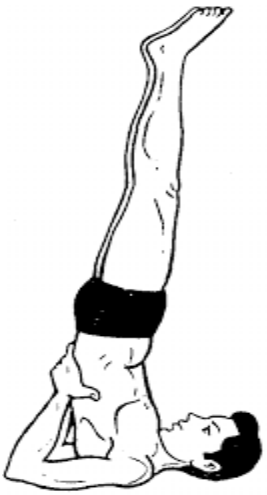
அனுபானம் : பால்

YOGA THERAPY FOR MALE INFERTILITY:

Yoga has been practiced in India for a number of centuries. There are several methods of yogic practice originating from different school of thoughts. Yogic exercises improve the psychological functions of the individual[49]. I shall deal with only such asanaas are useful in curing ailments and maintaining good health for the male infertility. **These group of Asanams are recommended for 45 mins to 1hr**

(Daily morning or Evening) (morning 6am and evening 6pm)

SARVANGASANAM:



It is stimulates the pituitary and thymus glands and keeps the prostate gland healthy. This asana keeps the sex glands healthy. Sexual weakness in the case of male can be overcome by the practice of asana[49].

MACHASANAM:

Improving the functioning of Thyroid gland and Improve Immune system

Increases bloodflow to genital areas

Imcrease vitality and preserves youthfullness.

SAVASANAM:

Savasanam is a Powerful Tranquilizer. It pacifies the body and a mind by eliminating muscular, Nervous, Mental and Emotional tension almost immediately[49].

DHANURASANA:

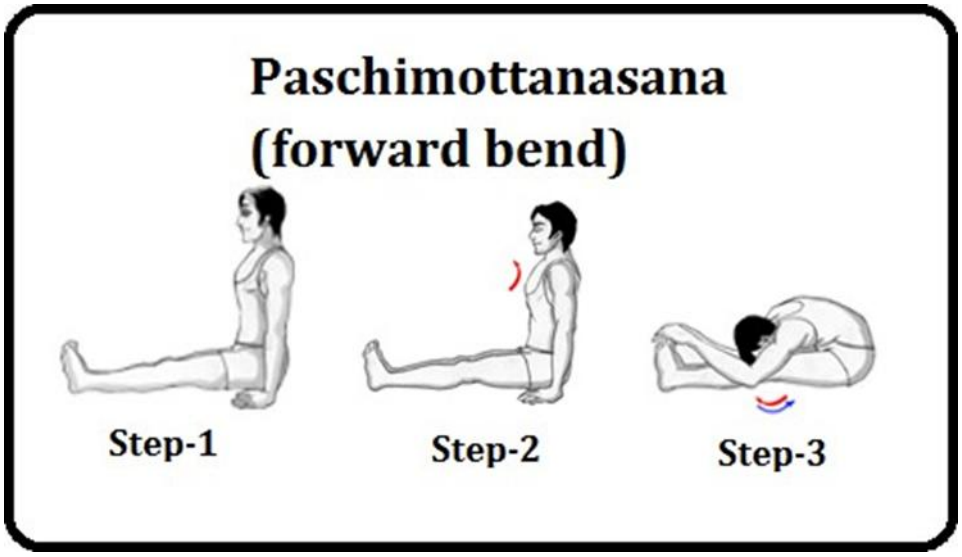
It improves functions of the reproductive system in male and female[50].

SHALABASANAM:

It promotes fresh Blood supply to Urogenital organs. It will effectively cure Nocturnal discharges and sexual debility[49].

PASCHIMOTTASANAM:

1.



Relieves dyspepsia,Strengthens urogenital system

MAHAMUDRA:

It help in the enhancing concentration power and increasing self-confidence.

PRANAYAMA:

- It gives a feeling of freshness, energy and lightness of body and mind.
- Strengthens the lungs. Increases its capacity and cures the disorders.
- Digestion is improved.
- Excretory system is stimulated. Toxins are removed from the body.
- Skin tone is well maintained.
- All the endocrine glands are stimulated.
- It makes the nervous system more energetic.
- It increases concentration and helps meditation

COOLING PRANAYAMA:

They are Cooling Pranayamas because of their cooling effect, and the help in calming down the mind by removing the mental anxiety & tension.

DIET AND ADVICE:

DIET TO BE ADDED

தாளி நன்முருங்கை தழைதூது ளம்பசலை
வாளி லறுகீரை நெய்வார்த்துண்ணி லாளியெண
விஞ்சுவார் போகத்தில் வீம்புரைத்த பெண்களெல்லாம்
கெஞ்சுவர் பின்வாங்கி கேள்.

-குணப்பாடம் மூலிகை வகுப்பு

கற்பம்:

சுக்கிலத்தம்பனம்[59]
மலட்டுக்குக் கற்பம்

-சித்த மருத்துவம் சிறப்பு. பக்கம் எண் 10 & 19

VEGETARIAN DIET:

- கீரை -தாளி, முருங்கை, பசலை, தூதுளம், அறுகீரை
- பூ -வாழை. தூதுவளை
- காய் -முருங்கைக்காய், முருங்கை பிஞ்சு
- பழம் -பேரிச்சு, மாதுளை, திராட்சை, நாவல், மாம்பழம்
- வித்துக்கள் -முந்திரி,வாதுமை, முருங்கை
- பால் மற்றும் பால் பொருட்கள்[60].

NON - VEGETARIAN DIET:

- பறவை-கோழி,காடை, கௌதாரி,வானம்பாடி
- மீன் - வாளை, விலாங்கு, விறால்
- இறைச்சி- வெள்ளாடு[60].

DIETS TO BE RESTRICTED:

- கொள்ளு
- பாகல்
- அகத்தி
- புளிப்பான பதார்த்தங்கள்
- மாங்காய்
- காபி, டீ
- போதை பொருட்கள்[60].

PATIENTS ADVICED TO FOLLOW:

- பகல் உறக்கம் கூடாது
- பகல் புணர்ச்சி கூடாது
- வாரம் இருமுறை எண்ணெய் குளியல்
- மூத்தமகளிரை புணர்தல் கூடாது
- பெண்களிடத்தில் மாதம் ஒருமுறை மட்டும் புணர்தல் வேண்டும்
- பிராணாயாமம்,தியானம், யோகாசன பயிற்சிகளை மேற்கொள்ள வேண்டும்[60].

MODERN ASPECT

MODERN ASPECT

Male Infertility

According to statistics collected from The World Health Organization (WHO) estimates that 60 to 80 million couples worldwide currently suffer from infertility[7]. The prevalence of infertility in the general population is 15%–20%. Of this, the male factor is responsible for 20%–40%[61]. In Indian couples seeking treatment, the male factor is the cause in approximately 23%[62]. In a World Health Organization multicenter study, 45% of infertile men were found to have either oligo-zoospermia or azoospermia[63]. A study from a tertiary care hospital in India reported 58% azoospermia and 24% oligozoospermia in infertile men[64].

Infertility can be of three different Types:

Primary Infertility:

When a woman has never achieved conception in her life it is known as Primary Infertility.

Secondary Infertility:

When a woman has given birth to a child in the past but is facing difficulty to conceive again it is called Secondary Infertility.

Recurrent Miscarriage:

Women who experience recurrent miscarriages may also receive a diagnosis of infertility if they experience two or more successive miscarriages. While miscarriage is not uncommon (occurring in up to 25% of recognized pregnancies), less than 5% of women will experience two miscarriages in a row, and less than 1% three or more successivemiscarriages.

Etiology:

Factors relating to male infertility include:-

Pre testicular causes:

a) Hypothalamopitutarydiseases

b) Hyperprolactinemia

c) Isolated FSHdeficiency

d) Congenital hypogonadrotrophicsyndrome

e) Exogenous hormones (estrogen- androgenexcess)

f) Glucocorticoidexcess

g) Hyper – andhypothyroidism

h) Drugs like phennytoin, androgens and estrogens

i) Alcohol,smoking

j) Strenuous riding (bicycle riding, horsebackriding)

Testicular Factors:

a) Testicular atrophy

b) Cryptorchidism

c) Varicocele

d) Trauma

e) Hydrocele

f) Mumps

g) Malaria

h) Spermatogenesisarrest

Post Testicular Causes:

a) Vas deferensobstruction

b) Lack of Vas deferens, often related to genetic markers for CysticFibrosis

c) Infection, e.g.prostatitis

d) Retrogradeejaculation

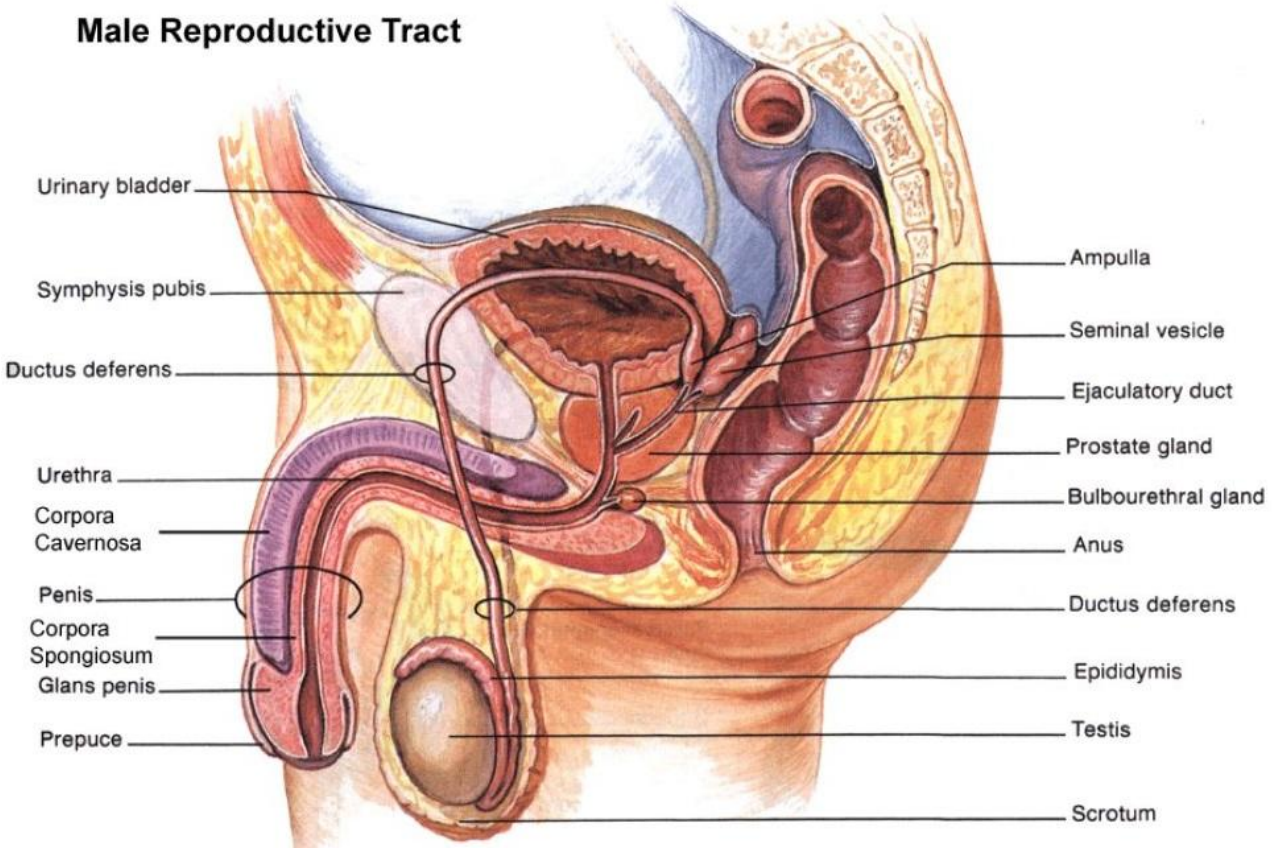
e) Hypospadias

f) Impotence

g) Acrosomal defect/egg penetration defect[65].

ANATOMY OF MALE REPRODUCTIVE ORGANS

The male reproductive system includes the testis, epididymis, ductus (vas) deferens, seminal vesicles, prostate and penis



TESTES:

The testes are the primary reproductive organs or gonads in the male. They are ovoid reproductive and endocrine organs responsible for sperm production. They are suspended in the scrotum by scrotal tissues including the dartos muscle and the spermatic cords. Average testicular dimensions are 4-5 cm in length, 2.5 cm in breadth and 3cm in anterio posterior diameter; their weight varies from 10.5-14g. The left testis usually lies lower than the right testis. Each testis lies obliquely within the scrotum, its upper pole tilted anterolaterally and the lower posteromedially.

The testis is invested by three coats;

Tunica vaginalis

Tunica albuginea

Tunica vasculosa**TUNICA VAGINALIS**

It is the lower end of the peritoneal process vaginalis, whose formation proceeds the decent of the fetal testis from the abdomen to the scrotum. The visceral layer covers all the aspect of the testis except most of the posterior aspect. The more extensive parietal layer reaches below the testis and ascends in front of and medial to the spermatic cord. The Inner surface of the tunica vaginalis has a smooth, moist mesothelium the potential space between its visceral and parietal layers is termed the cavity of the tunica vaginalis.

TUNICA ALBUGINEA

It is a dense, bluish white covering for the testis. It is composed mainly of interlacing bundles of collagen fibres. It is covered externally by the visceral layer of the tunica vaginalis, except at the epididymal head and tail and the posterior aspect of the testis, where vessels and nerves enter. It covers the tunica vasculosa

and, at the posterior borders of the testis, project in to the testicular interior as a thick, incomplete fibrous septum, the mediastinum testis.

TUNICA VASCULOSA

It contains a plexus of blood vessels and delicate loose connective tissue, and extend over the internal aspect of the tunica albuginea, covering the septa and therefore all the testicular lobules.

EPIDIDYMIS

The epididymis lies posteriorly and slight lateral to the testis, with vas deferens along its medial side. It has an expanded head superiorly, a body and a tail.Itsoveralllengthis6-7cmanditconsistsofthesingleconvolutedductus

epididymis formed by the union of the efferent ducts of the testis, which attach to the rete testis. From the tail the vas deferens ascends medially to the deep inguinal ring, within the spermatic cord[66].

TESTICULAR AND EPIDIDYAMAL APPENDICES

At the Upper extremities of the testis and epididymis are two small stalked bodies the appendix testes and appendix epididymis. They are developmental remnants of the para meso nephric ducts (mullerian) ducts and meso nephrons respectively.

TESTICULAR TORSION

The testis and epididymis are usually fixed to their surrounding tissues. In some patients this fixation may be insufficient, a condition which allows the structures to twist within the tunica vaginalis. This is termed testicular torsion and normally results in severe scrotal pain. Fertility may be affected by an episode of torsion.

SEMINAL VESICLES:

The two seminal vesicles are sacculated, contorted tubes located between the bladder and rectum. Each vesicle is 5 cm long, somewhat pyramidal, the base being directed up and posterolaterally. Essentially the seminal vesicle is a single

coiled tube with irregular diverticula. The coils and the diverticula are connected by the fibrous tissue. The diameter of the tube is 3-4 mm and its uncoiled length is 10-15cm[67].

VAS DEFERENS:

It is a muscular tube, 45 cm long, which conveys sperm to the ejaculatory ducts, and its distal continuation of the epididymis, starting at the epididymal tail. At first it is very tortuous, but it becomes straighter, and ascends along the posterior aspect of the testis. From the superior pole of the testis it ascends in the posterior part of the spermatic cord, and traverses the inguinal canal. At the internal inguinal ring the vas deferens leaves the cord, curves round the lateral side of the inferior epigastric artery. It then turns back and inclines slightly down and obliquelyacrosstheexternaliliacvesselstoenterthelesserpelvis.Itcrossesthe ureter and bends acutely to pass anteromedially between the posterior surface of the bladder and upper pole of the seminal vesicle. It finally descends to the base of the prostate, where it joins to the duct of the seminal vesicle at an acute angle to form the ejaculatoryduct[67].

EJACULATORYDUCTS

The ejaculatory ducts are formed on each side by the union of the duct of the seminal vesicle with ampulla of the vas. Each is almost 2 cm in length, starts from the base of the prostate, runs anteroinferiorly between its median right or left lobes.

SPERMATIC CORD:

At the testis traverse the abdominal wall into the scrotum during early life, it carries its vessels, nerves and vas deferens with it. These meet at the deep inguinal ring to form the spermatic cord, which suspends the testis in the scrotum and extends from the deep inguinal ring to the posterior aspect of the testis. The left cord is a little longer than the right. Between the superficial ring and testis the cord is anterior to the rounded tendon of adductor longus. The spermatic cord contains the vas deferens, testicular artery and veins, cremastric artery and artery to the vas deferens, genital branches of the genitofemoral nerve, cremastric nerve and sympathetic components of the testicularplexus.

Aberrant ductless:

A narrow, blind caudal aberrant ductile often occurs usually connected with the caudal part of the epididymal duct or with the start of the vas deference.

Paradidymis:

The paradidymis is a small collection of convoluted tubules found anteriorly in the spermatic cord above the epididymalhead.

SCROTUM

The scrotum is a cutaneous fibro muscular sac containing the testes and lower parts of the spermatic cords. It hangs below the pubic symphysis between theanteromedialaspectsofthethighs.Itisdividedintorightandlefthalvesbya cutaneous raphe, which continues ventrally to the inferior penile surface and dorsally along the midline of the perineum to the anus.

It consists of skin, dartos muscle and external spermatic, cremastric and internal spermatic fasciae. The scrotal skin is thin, pigmented and often rugose. It bears thinly scattered, crisp hairs. It has sebaceous glands, numerous sweat glands, pigment cells and nerve endings. The left side of the scrotum is usually lower because the left spermatic cord is longer.

PENIS

The penis is the male organ of copulation, consists of an attached root in the perineum and a free, normally pendulous body which is completely enveloped in skin. The penile skin is remarkably thin, dark and loosely connected to the tunica albuginea. At the corona of the penis it is folded to form the prepuce or foreskins, which variably overlap the glans. The prepuce and glans penis enclose a potential cleft, the preputial sac and the two shallow fossae flank thefrenulum.

Root of the penis:

The root of the penis is situated in the superficial perineal pouch. It is consists of three masses of erectile tissue in the urogenital triangle, namely the two crura and one bulb, each crus is firmly attached to the margins of the pubic arch and is covered by the ischiocavernosus. The blub is attached to the perineal

membrane in between the two crura. It is covered by thebulbospongiosus.

Body of the penis:

The body of the penis composed of three elongated masses of erectile tissue. During erection of the penis these masses become engorged with blood leading to considerable enlargement. When flaccid the penis is cylindrical, but when erect it is triangular with roundedangles.

Corpora cavernosa:

The corpora cavernosa of the penis form most of the body. On the urethral surface their combined mass has a wide median groove, adjoining the corpus spongiosum.

Corpus spongiosum:

The corpus spongiosum of the penis is traversed by the urethra. Near the end of the penis it expands in to a somewhat conical enlargement, called the glans penis[66].

REPRODUCTIVE AND HORMONAL FUNCTIONS OF THE MALE:

The reproductive functions of the male can be divided in to three major subdivisions:

(1) Spermatogenesis

(2) Male sexualcycle

(3) Regulation of male reproductive functions by varioushormones

GAMETOGENIC FUNCTIONS OF TESTES – SPERMATOGENESIS:

The production of gamete cells is called the gametogenic function. Spermatogenesis is the process by which spermatozoa are developed from the primitive germ cells called the spermatogonia of testis.

STAGES OF SPERMATOGENESIS:

Spermatogenesis occurs in four stages:

1. Stage ofproliferation
2. Stage ofgrowth
3. Stage ofmaturation
4. Stage oftransformation.

1. STAGE OFPROLIFERATION:

The spermatogonia near the basement membrane of seminiferous tubule are larger. Each spermatogonium contains diploid number of chromosomes (23 pairs in man) One member of each pair is from maternal origin and the other one from paternal origin. During the proliferative stage, the spermatogonia divide by mitosis without any change in chromosomal number. During this stage, the spermatogonia migrate along with sertoli cells towards the lumen of seminiferoustubule.

2. STAGE OFGROWTH:

In this stage, the primary spermatocyte grows into a large cell. Apart from growth, there is no other change in spermatocytes during this stage

3. STAGEMATURATION:

After reaching the full size, each primary sepermatocyte quickly undergoes meiotic or maturation division, which occurs in two stages.

I. First stage – two secondary spermatocytes areformed

II. Second stage – each secondary spermatocyte divides into twospermatids.

4. STAGE OFTRANSFORMATION:

The spermatids do not divide further but transform into matured spermatozoa (sperms) by a process called spermatogenesis.

STAGE OF SPERMATOGENESIS- NECESSARY HORMONES

Stage of spermatogenesis	Hormones necessary
1. Stage of proliferation	FSH, GrowthHormone
2. Stage of growth	Testosterone, Growth Hormone
3. Stage of maturation	Testosterone, Growth Hormone
4. Stage of transformation	Testosterone, Estrogen

ROLE OF HORMONES IN SPERMATOGENESIS:

Spermatogenesis is influenced by many hormones which act either directly or indirectly. The hormones necessary for spermatogenesis are,

1. Follicle stimulating hormone(FSH)
2. Testosterone
3. Estrogen
4. Luteinizing hormone(LH)
5. Growth hormone(GH)

1. FSH:

FSH is responsible for the intiation of spermatogenesis. It binds with Sertoli cells and induces the proliferation of spermatogonia. It also stimulates formation of estrogen and androgen binding protein from sertoli cells.

2. TESTOSTERONE:

It stimulates the spermatogenesis. It is also necessary for the formation of secondary spermatocyte from primary spermatocyte.

ESTROGEN:

This is secreted by Sertoli Cells. This is also necessary for spermeogenesis.

3. LH:

This hormone is essential for the secretion of testosterone from Leydig cells.

4. GH:

GH is essential for back ground metabolism of testis. It is also necessary for proliferation of spermatogonia. In pituitary dwarfs, the spermatogenesis is severely affected.

MATURATION OF SPERM IN THE EPIDIDYMIS:

After formation in the seminiferous tubules, the sperm require several days to pass through the 6-meter long tubule of the epididymis. Sperm removed from the seminiferous tubules and from the early portions of the *epididymis* are non-motile, they cannot fertilize an ovum. However after the sperm have been in epididymis for some 18 to 24 hours they develop the capability of motility even though several inhibitory proteins in the epididymal fluid still prevent final motility until after ejaculation.

STORAGE OF SPERM:

The two testes of the human adult form up to 120 million sperm each day. A small quantity of these can be stored in the epididymis but most are stored in the vas deferens. They can remain stored maintaining their fertility for at least a month. During this time they are kept in a deeply suppressed inactive state by multiple inhibitory substances in the secretions of the duct. Conversely with a high level of sexual activity and ejaculations storage may be no longer than a few days. After ejaculation the sperm become motile and they also become capable of fertilizing the ovum a process called maturation. The sertoli cells and the epithelium of the epididymis secrete a special nutrient fluid that is ejaculated along with sperm. This fluid contains hormones and enzymes and special nutrients that are essential for sperm maturation.

PHYSIOLOGY OF THE MATURE SPERM:

The activity of sperm is greatly enhanced in a neutral and slightly alkaline medium as exists in the ejaculated semen but it is greatly depressed in a mildly acidic medium. A strong acidic medium can cause rapid death of sperm. The activity of sperm increases markedly with increasing temperature. Although the sperm can live

for many weeks in the suppressed state in the genital ducts of the testes. Life expectancy of ejaculated sperm in the female genital tract is only 1 to 2days (24 to 48 hours).

ROLE OF SERTOLI CELLS IN SPERMATOGENESIS:

Sertoli cells influence spermatogenesis by the following ways :

1. Sertoli cells provide nutrition to the developing sperms.
2. sertoli cells secrete estrogen, which is essential for spermatogenesis.
3. sertoli cells secrete hormone binding proteins. These proteins bind with testosterone and estrogen and carry the hormones into the fluid of somniferous tubules.
4. sertoli cells make these hormones available for the maturation of sperms.

CLOTTING OF SEMEN:

The clotting enzymes in prostatic secretion cause conversion of fibrinogen into coagulum. It is essential for holding the sperms in uterine cervix.

LYSIS OF COAGULUM:

The coagulum is dissolved by fibrolysin of the prostate secretion so that the sperm become motile.

SEMEN:

Semen is a white or grey fluid that contain spermatozoa .It is the collection of fluid from testis, seminal vesical, prostate and bulbourethral gland. Semen is discharged during sexual act and the process of discharge is called ejaculation. At the time of ejaculation, human semen is liquid in nature. Immediately, it coagulates and some time it undergoes a secondary liquefaction.

PROPERTIES OF SEMEN:

1. Specific gravity: 1.028
2. Volume: 2 to 6ml/ejaculation
3. Reaction:
4. Alkaline pH of 7.5.the alkalinity is due to the secretions from prostate.

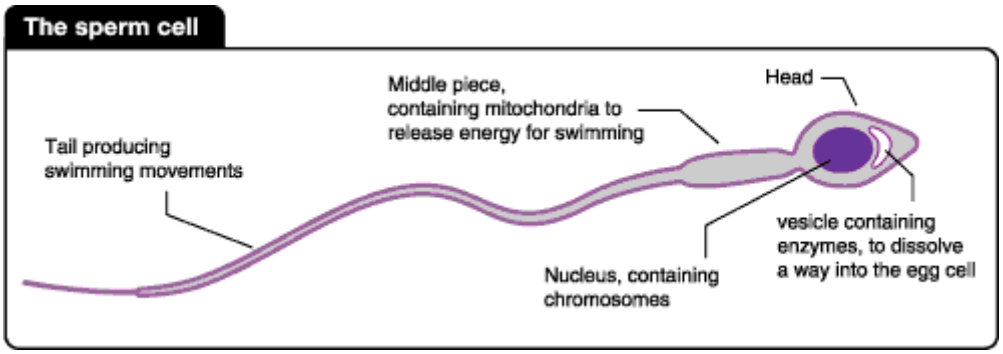
COMPOSITION OF SEMEN:

Semen contains

1. Sperms	: 10%
2. Products fromseminalvesicle	: 60%
3. Products fromprostate gland	: 30%

SPERM:

The total count of sperm is about 100 to 150 million /ml of semen. Male sterility occurs, when the sperm count is less than 20 million/ml. After ejaculation of sperm, the survival time is only about 24 to 48 hours at a temperature equivalent to body temperature. The rate of motility of sperm in female genital tract is about 3mm/minute. The sperm reach the fallopian tube in about 30 to 60 minute after sexual intercourse. The Uterine contraction during sexual act facilitates the movement of sperms.



CAPITATION OF THE SPERMATION:

Mature sperm, even when they are coming out of the male genital tract are incapable of fertilizing the ovum unless the further changes or capitation takes place for a variable period 1 to 10 hours in the female genital tract. The membrane of the sperm thus become progressively permeable to calcium ion that enters in abundance to initiate the powerful whiplash forward movement of the flagellum or tail instead of its previous undulating motion. Calcium has a further role to bring about further chance in the acrosome intracellular membrane for helping to releasing its enzyme very rapidly in female genitaltract.

THE ACROSOMEREACTION:

The lytic enzyme involved in the sperm penetration is mostly located in the anterior sperm head, whereas other such as acrosin are primary contained within the acrosome. The anterior surface of the head needs to be removed allowing liberation of acrosin before the sperm can be penetrating zona pellucida. Removal of this anterior surface of the head is the process called acrosome reaction.

MECHANISM OF ERECTION:

The male erectile response is a vascular event initiated by neuronal action and maintained by a complex interplay between vascular and neurological, and perhaps humoral phenomenons resulting in cascade of events. Erection of penis in simple terms consists of trapping pressurised blood within the confines of a limited space provided by the spongy corpora cavernosa. This blood – filled spaces relax and open up, allowing free inflow of blood leading to expansion of the chambers pulling the tunica albuginea tight. The tensed tunica albuginea makes the corpora hard (resistant to indentation) and rigid (resistant to flexion). Secondarily, it pinches off the veins (that normally let blood leave the chambers) trapping blood inside and contributing to the state of engorgement .The valves (actually flaps), according to some experts) that control the flow of blood, however are opened and closed by nerves that run through the spinal cord to the brain. Activation by the nervous system causes a rapid increase in the blood flow into the penis. During erection, as blood flows into the penis, the holes in the spongy tissue in the penis get filled in with it. At the same time, flaps in the veins leading out of the penis enlarge, cutting off the outflow. Thus, more blood flows in than out, and the penis are compressed from the increased pressure from the erection itself. In addition, the heart rate and blood pressure increase the pressure of blood into the penis increases to maintain its hardness.

MECHANISM OF EJACULATION:

The emission phase is the first phase. It involves deposition of seminal fluid from the ampullary vas deferens, seminal vesicles and prostate gland into posterior urethra. The second phase is the expulsion phase. It involves closure of bladder neck followed by the rhythmic contractions of the urethra by pelvicperineal and bulbospongiosus muscle, and intermittent relaxation of external urethra sphincters. It is believed that the neurotransmitter serotonin (5HT) plays a central role in modulating ejaculation. Several animal studies have demonstrated its inhibitory effect on ejaculation. Therefore, it is perceived that low level of serotonin in the synaptic cleft in these specific areas in the brain could cause premature ejaculation. This theory is further supported by the proven effectiveness of selective serotonin reuptake inhibitors (SSRIs), which increase serotonin level in the synapse, in treating PE. Sympathatic motor neurons control. The emission phase of ejaculation reflex and expulsion phase is executed by somatic and autonomic motor neurons. These motor neurons are located in the thoraco lumbar and lumbo sacral spinal cord and are activated in a coordinated manner when sufficient sensory in a coordinated manner when sufficient sensory input to reach the ejaculatory threshold has entered the central nervous system. Several areas in the brain, and especially the nucleus paragigantocellularis, have been identified to be involved in ejaculatorycontrol.

MALE SEXUAL HORMONE:

The testes secrete the male sex hormones are called the androgens. The testicular Androgens are:

1. Testosterone
2. Dihydrotestosterone
3. Androstenedione

SOURCE OF SECRETION OF ANDROGENS:

The androgens are secreted in large quantities by testes and in small quantities by adrenal cortex.

TESTES:

In testes, the androgens are secreted by the interstitial cells of leydig. This forms 20% of mass of adult testis, leydig cells are numerous in newborn male infant and in adult male after puberty.

ADRENAL CORTEX:

Zona reticularis of adrenal cortex also secretes androgens called testosterone, androstenedione and dehydro-epiandrosterone.

FUNCTION OF TESTOSTERONE:

In general, testosterone is responsible for the distinguishing characters of masculine body. In the fetal life, the tests are stimulated by human chorionic gonadotropins secreted by placenta.

SEX DIFFERENTIATION IN FETUS:

Testosterone is responsible for the sex differentiation.

Mullerian Duct

From this duct, female accessory sex organs like vagina, uterus and fallopian tube are developed.

Wolffian Duct

From this, male accessory sex organs like epididymis, vas deferens and seminal vesicles are developed.

.**DESCENT OF TESTES:**

Initially, testes are developed in the abdominal cavity and are later pushed into the scrotum through inguinal canal just before birth. This is called the descent of testes. Testosterone is necessary for this. If a male child is born with undecended testes, the condition is called „cryptorchidism“ .

FUNCTION OF TESTOSTERONE IN ADULT LIFE:

Testosterone has two important functions in adult,

i. Effect on sexorgans

ii. Effect on secondary sexualcharacters

ON SEX ORGANS:

Testosterone increases the size of penis, scrotum and the testes after puberty.

ON SECONDARY SEXUAL CHARACTERS:

Testosterone causes development of secondary sexual characters at puberty, which distinguishes the male from female. The secondary sexual characters developed by testosterone are as follows:

MUSCULAR GROWTH:

One of the most important male sexual characters is the development of musculature after puberty. The mass of the muscle increases by about 50% is due to

the anabolic activity of testosterone on proteins.

BONE GROWTH:

After puberty the bones grow in thickness with deposition of calcium. The increase in thickness is due to increase in total content of bone matrix which is because of protein anabolic activity of testosterone. Testosterone causes broadening of shoulders and it has a specific effect on pelvis which resultsin,

a) Narrowing of pelvicoutlet

b) Lengthening ofpelvis

c) The funnel like shape ofpelvis

Pelvis in males is different from that of females, which is broad and ovoid in shape.

Testosterone also causes early fusion of epiphyses of long bones with shaft.

CHANGES IN SKIN:

Testosterone increases the thickness of skin over the entire body surface and the ruggedness of subcutaneous tissue. These changes in skin are due to deposition of proteins in skin.

HAIR DISTRIBUTION:

The testosterone causes male type of distribution of hair on the body. i.e. hair growth over the pubis, along linea alba up to umbilicus, on face, on chest and other parts of the body like back, in males, the pubic hair has the base of the triangle downwards.

CHANGE IN VOICE:

At puberty, testosterone causes hypertrophy of laryngeal muscles, the enlargement of larynx and lengthening and thickening of vocal cords.

BASAL METABOLIC RATE:

At the time of adolescence and earlier part of adult life, thetestosterone increases the BMR rises 5 – 10%. This is mostly due to anabolic effects of testosterone on proteinmetabolism.

ELECTROLYTE AND WATER BALANCE:

Testosterone increases the retention of sodium by reabsorption in renal tubules. The action is very mild.

BLOOD:

After puberty, testosterone causes slight increase in blood volume by increasing water content and by increasing the number of RBCs.

CONTROL OF MALE SEXUAL FUNCTIONS BY HORMONES

A major share of the control of sexual functions in both male and female begins with secretion of gonadotropin releasing hormone (GnRH) by the hypothalamus. This hormone in turn stimulates the anterior pituitary gland to secrete two other hormones called the gonadotropic hormones.

1. Luteinizing hormone (LH) – This hormone is essential for the secretion of testosterone from leydigcells.
2. Follicle stimulating hormone (FSH) – it accelerates the process of spermatogenesis, Combination withtestosterone.

NEGATIVE FEEDBACK CONTROL OF TESTOSTERONE:

Testosterone regulates its own secretion by negative feedback mechanism. It acts on hypothalamus and inhibits the secretion of LHRH. When LHRH secretion is inhibited, LH is not released from anterior pituitary resulting in stoppage of testosterone secretion from testes. On the other hand, when testosterone production is low, lack of inhibition of hypothalamus leads to secretion of testosterone through LHRH and LH.

ABNORMALITIES OF SEXUAL FUNCTION:

ENLARGEMENT OF PROSTATEGLAND:

Enlargement of prostate gland occurs dueto**:**

1. Hyperplasia of glandular structures and connectivity tissues benign (non-malignant)enlargement
2. Cancer – malignant enlargement

HYPOGONADISM IN MALES:

Hypogonadism is a condition characterized by reduction of functional activity of gonads.

SIGNS AND SYMPTOMS:

The clinical picture of male hypogonadism depends upon whether the testicular deficiency develops before or afterpuberty.

BEFORE PUBERTY:

The symptoms of hypogonadism are similar to those developed due to extirpation of testes before puberty.

AFTER PUBERTY:

The symptoms are similar to those developed due to removal of testes after puberty.

IN ADULT:

Hypogonadism caused by testicular disorder increases the gonadotropin Secretion and the condition called hypergonadotropic hypogonadism. Hypogonadism that occurs due to deficiency gonadotropin is called hypogonadotropic hypogonadism.

FROHLICHS SYNDROME:

It is the disorder characterized by obesity and hypogonadism in adolescent boy also called adiposo genital syndrome or hypothalamic eunuchism.

EFFECT OF TEMPERATURE ON SPERMATOGENESIS:

Increasing the temperature of the testes can prevent spermatogenesis by causing degeneration of most cells of the seminiferous tubules besides the spermatogonia. It has often be stated that the reason, the testes are located in the dangling scrotum is to maintain the temperature of these glands, below the internal temperature of the body, although usually only about 2º C below the internal temperature. On cold days scrotal reflexes cause the musculature of the scrotum to contract, pulling the testes close to the body to maintain this 2º C differential. Thus the scrotum theoretically acts as a cooling mechanism for thetestes.

CRYPTORCHIDISM:

Cryptorchidism means failure of the testis to descent from the abdomen in to the scrotum at or near the time of birth of a fetus. During development of the male fetus, the testes are derived from the genital ridges in the abdomen. A testis that remains throughout the life in the abdominal cavity is incapable of forming sperm. The tubular epithelium undergoes degeneration, leaving only the interstitial structures of thetestis.

SEMEN ANALYSIS:

COLLECTION:

The semen specimen should be collected in a small clean wide mouthed jar of 10 to 20 ml (using larger jar may cause drying of some portion, when it is transported to the laboratory). The container must be spotlessly clean. Masturbation (self-stimulation) is the most preferred method. Coitus interrupts (withdrawal of penis just prior to ejaculation during sexual intercourse) may be used, but there is always a possibility of loss of the sperm rich initial portion. The container must be ideally

warmed to the body temperature, as sperms are especially susceptible to cold. The slide must be warmed, as otherwise motility studies may show erroneous result. Masturbation can be very stressful for some men especially when they know their counts are low, or if they have had problems with masturbation on demand for semen analysis in the past. The condition of the toilet room, where the patient has to go for procuring the specimen, is often related to their not providing the proper specimen. Men failing to provide a specimen could be advised either to have female partners beside or to see sexually arousing pictures for helping them to provide sample. They can also use a mechanical vibrator to get an erection. In some cases, additional assistance by using liquid paraffin helps in masturbation. The infertility centres should have a special private room to allow the patients for the masturbation on demand. The semen samples must be collected after a sexual abstinence 3 to 5 days, or at least 72 hours after the last ejaculation (no sex or masturbation). It is very important to keep with the chosen abstinence schedule, because variations in the time period between ejaculations interfere with the accuracy of test results. For up to one week, semen characteristics, such as volume and sperm concentration, may increase with each day of abstinence; but after that period, the sperm motility is usually impaired.

COMPONENTS OF SEMEN ANALYSIS:

- Sperm count
- Motility
- Morphology
- Volume
- Fructose level
- pH

SPERM COUNT:

Sperm count, or sperm concentration to avoid mix-up, measures the concentration of sperm in a man's ejaculate, distinguished from *total sperm count*, which is the sperm count multiplied with volume. Anything over 20 million sperm per milliliter is considered normal. Anything less is considered „oligospermia“ . The average sperm count today is around 60 million per milliliter in the Western world, having decreased by 1-2% per year from substantially higher number decades ago.

MOTILITY:

A more specified measure is *motility grade*, where the motility of sperm is divided into four different grades:

 Grade 4: Sperm with progressive motility. These are the strongest and swim fast in a straight line. Sometimes it is also denoted motility **a**.

 Grade 3: (non-linear motility): These also move forward but tend to travel in a curved or crooked motion. Sometimes also denoted motility **b**.

 Grade 2: These have non-progressive motility because they do not move forward despite the fact that they move their tails.

 Grade 1: These are immotile and fail to move at all.

MORPHOLOGY:

i. Head - The head should be oval andsmooth.

ii. Mid piece - the mid piece should be straight and slightly thicker than the tail.

iii. Tail - the tail should be single, unbroken, straight and withoutcoils.

VOLUME:

The volume of the sample is measured between 1.0 mL and 6.5 mL is normal; WHO criteria specify that any volume greater than 2.0 mL is normal. Low volume may indicate partial or complete blockage of the seminal vesicles, or that the man was born without seminal vesicles. In clinical practice, a volume of less than 2 mL in the setting of infertility and absent sperm should prompt an evaluation for obstructive azoospermia.

FRUCTOSE LEVEL:

The normal level of fructose in the semen is at least 3 mg/ml. WHO specify a normal level of 13 μmol per sample. Absence of fructose may indicate a problem with the seminal vesicles.

pH:

The normal range of pH of the sample is 7.1-8.0; WHO criteria specify normal as 7.2-7.8. Acidic ejaculate (lower pH value) may indicate one or both of the seminal vesicles are blocked. A basic ejaculate (higher pH value) may indicate an infection. A pH value outside of the normal range is harmful to sperm.

LIQUEFACTION:

The liquefaction is the process when the gel formed by proteins from the seminal vesicles is broken up and the semen becomes more liquid. It normally takes less than 20 minutes for the sample to change from a thick gel into a liquid. An abnormally long liquefaction (more than 30 minutes) time may indicate an infection.

TOTAL MOTILE SPERMATOZOA:

Total motile spermatozoa (TMS) or *total motile sperm count* (TMSC) is a combination of sperm count, motility and volume, measuring how many million sperm cells in an entire ejaculate is motile. Use of approximately 20 million grade 3+4 sperm in ICI, and 5 million ones in IUI may be an approximate recommendation.

OTHERS:

The sample is tested for white blood cells. A high level of white blood cells (over 1 million per milliliter) may indicate an infection.

ABNORMALITIES:

i. Aspermia: absence ofsemen

ii. Azoospermia: absence of sperm

iii. Oligospermia: low number ofsperm

iv. Asthenozoospermia: poor sperm motility

v. Teratozoospermia: sperm carry more morphological defects thanusual[68].

ADVANCED SPERM FERTILITY TESTES:

COMPUTER-ASSISTED SEMEN ANALYSIS (CASA)

The new technologies such as CASA incorporate the video systems to measure the types and the speed of sperm motility. Normal sperms swim faster and straighter than the abnormal ones. The average speed of a human sperm is roughly 48 to 96 mm per second. CASA permits the measurement of additional motility parameters such a curvilinear velocity (VCL), straight-line velocity (VSL), linearity, and flagellar beat frequency. CASA Measures the parameters such as VCL, VSL and amplitude of lateral head (ALH). The quality of sperm movement is based on a classification system of 0 to 4, wherein 0 represents no movement and 4 represents excellent forward progression; for example, a semen sample with 60% motility would be characterized as 3+ to4.2.

QUALITY ASSESSMENT OF CASA:

Three levels of quality assessment are generally accepted: structure, process and results.

SPERM CLUMPING OR AGGLUTINATION:

The sperms may clump head-to-head, tail-to-tail, or head-to-tail. In particular tail-to-tail agglutination of motile sperm is noteworthy and usually is followed up with SpermFunction.

SEMEN CULTURE TEST:

In a semen culture test, the semen sample is tested for the presence of bacteria. Testing the bacterial sensitivity to antibiotics is mandatory if there is any presence of bacteria. Whether the bacteria present in the specimen is that are usually seen in normal semen or those of a bacterial disease, without the evidence of inflammation or infection, there is no indication for routine culture or antibiotic treatment in infertile men. If urine analysis is abnormal or bacterial prostatitis is suspected from the history or the physical examination, semen culture is certainly indicated. The common sexually transmitted organisms such as Chlamydia trachomatis, Mycoplasma hominus and Ureaplasma urealyticulum have been implicated in reproductive failure in animals and humans.

BIOCHEMICAL TESTS:

Biochemical analysis of seminal plasma mostly provides insights into the function of the accessory sex glands. The fructose content of semen (normal value - 250-400 mgm or 4-28 mmol/litre) should be routinely tested. Low fructose content (less than120 mgm) is often due to seminal vesiculitis, androgen deficiency or partial ejaculatory duct obstruction. Its absence indicates complete obstruction either due to a congenital block at the level of ejaculatory duct or proximal to it like agenesis of the vas and the seminal vesicle or following acquired post-infective cicatrisation. Almost invariably, these conditions are associated with azoospermia or severe oligospermia. The epididymis is represented by glyceryphosphorylcholine (GPC), the seminal vesicles by fructose, and the prostate gland by zinc.

IMMUNOLOGICAL TESTS:

In the enzyme-linked immune sorbent assay (ELISA) test, the antisperm antibodies measuring up to 20 units/m in 32 or 64 dilutions is considered normal.

SPERM FUNCTION TESTS:

Thespermfunctiontestsassessthesperm‟ sabilitytofertilizetheovum.There is a drawback that these tests are often not standardizedadequately.

SPERM VIABILITY OR SPERM SURVIVAL TEST:

The sperm viability may be determined by two methods-Eosin Y stain exclusion and hypo-osmotic swelling or HOS assay.

BOVINE CERVICAL MUCUS TEST:

The bovine cervical mucus test is another form of testing for the ability of the sperms to penetrate and swim through cervical mucus. These tests to assess thefertilizing potential of sperms. This in vitro functional test measures the ability of penetration of the sperms. The end point of this assay is penetration of the ovum and decondensation of sperm heads. Men with sperm of low SPA score are less likely to achieve a spontaneous pregnancy than those with high SPA score.

SPERM CHROMATIN STRUCTURAL ASSAY (SCSA):

To measure the level of DNA fragmentation in the sperm is to help the diagnosis and treatment for male infertility. The sperm with high levels of DNA fragmentation have a lower probability of producing a successful pregnancy. Vitamin C protects the sperms from endogenous oxidative DNA damage that could affect sperm quality and increased risk of genetic defects, particularly in population with low ascorbic acid like smokers against free radical damages. 24 Studies show that a daily dose of 1000 mg showed statistically significant improvement ofsperms.

THE POSTCOITAL TEST(PCT):

It is first performed by Sims, has traditionally been a common way to determine cervical mucus/sperm interaction. This test evaluates sperm concentration and motility in an aspirate of cervical mucus at midcycle shortly after the couple has intercourse. Results of a normal PCT would show the presence of 20 or more spermatozoa per high-power field. An abnormal PCT results most commonly is secondary to inappropriate timing of coitus. Other causes include ASA, an ovulation, an abnormal hormonal milieu, female or male genital tract infections, poor semen quality, and male sexualdysfunction.

Sperm Penetration Assay (Spa):

The SPA was developed to measure the functional properties of sperm and was initially developed following the observation that, upon the removal of the zona pellucida of hamster ova, the species specificity of fertilization and the block to polyspermy are lost. In particular, heterologous penetrations between hamster ova and sperm from a variety of species, including humans, has been observed. Ideally, human ova should be used for this assay, but they are not widely available, and there are ethical problems associated with their use. Therefore, hamster ova have provided a useful model for the measurement of human sperm function. For fertilization to occur *in vivo*, the sperm must first be capacitated and have undergone the acrosome

reaction. The physiology of sperm capacitation is not clearly defined. In particular, it is not known whether capacitated sperm that have gained the ability to penetrate humanovahaveundergonetheacrosomereaction,orwhetherthisoccursasalocal

event at the time of gamete fusion. The use of SPA as a measure of potential fertility is based on the theory that fertile sperm samples will either penetrate most hamster ova or result in a significant amount of polyspermy of the penetrated ova. Infertile sperm samples are expected to penetrate a lower percentage of ova or result in a lesser degree of polyspermy. Consideration should be given to obtaining the SPA in couples with unexplained infertility or in couples in whom the decision is being made to precede with intrauterine insemination (IUI) or IVF, since lower SPA results have been predictive of poor success with IVF and lower pregnancy rates in couples attempting conception throughintercourse.

REACTIVE OXYGEN SPECIES (ROS) ASSAY:

For cells living under aerobic conditions, oxygen represents a paradox: While it is required for survival and normal function, its metabolites can be potentially toxic due to the generation of oxygen-free radicals. Some of these metabolites, called ROS, have been shown to be produced by spermatozoa and to generate toxic effects on sperm function. However, when produced at the right time and amount, these ROS can also initiate and promote normal physiologic reactions such as sperm hyperactivation and capacitation. In human semen, high ROS formation was detected in 40% of semen samples from an unselected population of men consulting an infertilityclinic.

NUTRITION:

ZINC:

Zinc is the most important nutrient mineral influencing male fertility. Zinc level in the seminal plasma is directly related to sperm motility. Dietary zinc restriction reduces both sperm count and seminal plasma volume. Zinc levels in seminal plasma of normal, oligospermic, asthenospermic and azoospermic subjects show that a linear direct relationship seems to exist between zinc in seminal plasma and motility of spermatozoa. Dietary restriction of zinc can affect testicular function adversely. The serum testosterone concentration and seminal volume are most sensitive to zinc depletion in men in the reproductive period.

VITAMIN B 12:

Vitamin B 12 deficiency also plays a role in fertility. “Intrinsic factor” is necessary for the proper absorption of B12 and its deficiency is one of the causes of secondary infertility in male.

VITAMIN C:

Studies have shown the concentration of ascorbic acid in seminal plasma directly reflects dietary intake, and lower levels of vitamin C may lead to infertility andincreaseddamagetothesperm‟ sgeneticmaterial.36Fragaetaldemonstratedthis by reducing ascorbic acid intake in healthy men from 250 mg to 5 mg per day. Seminal plasma levels of vitamin C decreased by 50 percent, with a concomitant 91- percent increase in sperm with DNAdamage.

L-ARGININE:

The biochemical and physiological relevance of L-arginine lies in its role as the precursor in the synthesis of polyamines and testosterone. The polyamines putrescence and spermidine are organic components important to sperm motility. An arginine metabolism is a factor in normal sperm production being involved as a source of nitric oxide within spermatozoa. Nitric oxide (at endogenous concentrations) appears to be necessary for adequate sperm motility. The endothelial (eNOS) and brain (b NOS) nitric oxide syntheses are abundant in normozoospermic samples but is low in asthenozoospermic patients. Consequently, an adequate dietary amount of Larginine is necessary for normal spermatogenesis, especially for the sperm motility and arginine aspartate (9 g daily) has been found to be effective in some cases of asthenospermia. Larginine, 4 gm. daily has been shown to improve sperm counts in men with oligospermia. Nuts, oilseeds, flesh foods, pulses and legumes are common sources ofL-arginine.

VITAMIN E:

The membranes of the germ cells and spermatozoa are very sensitive to oxidation because of their high content of PUFA (Polyunsaturated fatty acids).Vitamin E is a major lipophilic chain-breaking anti-oxidant, which protects tissue PUFA against peroxidation, a property that is beneficial in the male reproductive physiology. Oral78 administration of vitamin E significantly improves the in vitro function of human spermatozoa as assessed by the zona binding test. Vitamin E antioxidant therapy is however, dependent on the dosage or the in vitro concentration of the vitamin. Vitamin E in a dose of 200 IU twice daily acts an antioxidant and improves sperms‟ ability toimpregnate.

SELENIUM:

Men with reduced sperm motility, supplementation with selenium (100 mcg per day for three months) significantly increased sperm motility, but it had no effect on sperm count. Selenium is one of the important ingredients that is very often lacking in order mean and can be found in horsetail, which has been used with success in ED following prostaticenlargement.

L- Carnitine:

Sperm motility also increased both in quantitative and qualitative manners. In a multicentric study, increase in the sperm motility was also observed in terms of both rapid linear progression and linearity index along with that the sperm output after oral administration of L -carnitine in patients with idiopathic asthenozoospermias. Two amino acids Iysine and methionine that is necessary for the biosynthesis of L-carnitine in the body.

ANTIOXIDANTS:

Polyunsaturated fatty acids and phospholipids are key constituents in the sperm cell membrane and are highly susceptible to oxidative damage. Sperm produce controlled concentrations of reactive oxygen species, such as the superoxide anion, hydrogen peroxide, and nitric oxide, which are needed for fertilization; however, high concentrations of these free radicals can directly damage sperm cells. Disruption of this delicate balance has been proposed as one of the possible etiologies of idiopathic male infertility. About someAnti-oxidants,

- Vitamin A alone improved sperm function and IVF rates in studies.
- Vitamin A, Vitamin E, and essential fatty acids (omega-3 fats) were shown to increase sperm count in another study.
- Folic acid and zinc may increase sperm concentration.
- The bottom line: having a healthy diet is important for male fertility. You should have a diet rich in a variety fruits and vegetables and take a good quality multivitamin daily. You may also consider taking an omega-3 supplement, if your intake of fish is low.

COENZYME Q-10:

In sperm cells, coenzyme Q10 (CoQ10) is concentrated in the mitochondrial midpiece, where it is involved in energy production. It also functions as an antioxidant, preventing lipid peroxidation of sperm membranes. When sperm samples from 22 asthenospermic men were incubated *in vitro* with 50 micro CoQ10, significant increases in motility were observed. CoQ10 (60 mg) was given to 17 infertile patients for a mean 103 days, and although there were no significant changes in standard sperm parameters, there was a significant improvement in fertilizationrate

TRIAL DRUG

LITERATURE REVIEW OF TRIAL DRUG:

PREPARATION AND PROPERTIES OF TRIAL DRUG:

DRUGNAME : **THETRAN ILAGAM**
TEXT REFERENCE : Anuboga vaithya navanetham (part-8)**, Page no: 143**

INGREDIENTS:

1. Thetrankottai (Strychnos potatorum) - 70 gms
2. Narseeragam (Cuminum cyminum)- 35 gms
3. Kasakasaa (Papaver somniferum) - 17.5 gms
4. Lavangapattai (Cinnamomum verum) - 5.2gms
5. Vaalmelagu (Piper cubeba) - 5.2gms
6. Sapjavithai Ocimum basilicum(seeds) - 5.2gms
7. Saathikkaai (Myristica fragrans) Each one
8. Saathipathri(Myristica fragrans)
9. Melagu (Piper nigrum)
10. Esappukool vithai (Plantago ovate) (10.5gram)
11. Poonaikan kungiliyam Pistacia lentiscus
12. Madhulai vithai(Punica granatum)
13. Neermulli vithai(Hygrophila auriculata)
14. Seemai thanneervittankizhangu - Asparagus racemosus - 35 gm
15. Nilappanai kizhangu(Curculigo orchioides) -35 gm
16. Omam(Trachyspermum ammi) -17.5 gm
17. Thiratchai pazham(Seeds removed)-Vitis vinifera -26 ¼ gm
18. Perichchan pazham(Seeds removed)- Phoenix dactylifera - 43 ¾ gm
19. Saarap paruppu -Buchanania Lanzan -35 gm
20. Padham paruppu -Prunus dulcis -280 gm
21. Nattu Sarkkarai -Jaggery -350 gm
22. Karkandu -Rock candy 175 gm
23. Nei -Ghee -175 gm

METHOD OF PREPERATION:

All the above mentioned ingredients are purified as per the text of chikitcha rathna theepam raw drug no 17 and 18 made paste with using milk, Other raw drugs after purification make a fine powder and choorana suththi with the use of milk. And make paagu ,mixture with choornam then Ghee added medicine prepared stored in an air tight Glass container.

Standard Operating Procedure

Source of raw drugs:

The required raw drugs for the trial medicineswas purchased from a well reputed raw drug shop andthe raw drugs would authenticated by Assistant Professor Medicinal Botany and Gunapadam HOD . After that the raw drugs would purified as per siddha literatures in the presence of faculty members, then the trial drugs were prepared in the Gunapadam laboratory of National Institute of Siddha by following Standard operating Procedures.

PURIFICATION METHOD:

Thetran kottai:

Soak in butter milk for a period of 1 saamam (3 hours) then allow it to dry

Narseeragam:

Cleaned & remove dust Dried in sunlight shadow and fried.

Kasakasaa:

Cleaned & remove dust Dried in sunlight shadow and fried.

Lavangapattai:

Dried in sun light shadow and fried.

Vaalmilagu:

Removed stem and dried in sun shadow .

Sathikkai:

Remove the outer cover, cut into small pieces and dry it in sun shadow.

Elavanga pathiri:

Dried in sun shadow and fried

Sapjavithai:

Cleaned & remove dust Dried in sunlight shadow and fried.

Esappukol vithai:

Cleaned & remove dust Dried in sunlight shadow and fried.

Neermulli vithai:

Dried in sun shadow and fried

Milagu:

Soak in butter milk for a period of 1 saamam (3 hours) then allow it to dry.

Maathulai vithai:

Dried in sun shadow and fried.

Poonaikan kungiliyam:

Boiled in Tender coconut water and dry.

Saathipthri:

Clean with cloth remove any decay part.

Saalaamisiri:

Dried in sun shadow and fried.

Omam:

Drenched in limestone water and dried.

Seemai thanneervittan kizhangu :

Dry and make fine powder and pittaviyal boiled 1 samamam (3 hours) then sun shadow .

Nilampanai kizhangu:

Dry and make fine powder and pittaviyal boiled 1 samamam (3 hours) then sun shadow .

Saarapparu:

Cleaned & remove outer skin Dried in sunlight shadow and fried.

Bhadham paruppu:

Cleaned & remove outer skin Dried in sunlight shadow and fried.

Nattu sarkkarai:

Grined and saliththal by using muram

Pericham pazham :

Remove the seed

DISPENSING:

The Ilagam is given in 70 gram in packets .(5gm after food along with milk twice a day) for 7 days

THETRAN VITHAI

THETRAN VITHAI – *Strychnos potatorum*

SUVAI - KAIPPU

THANMAI -VEPPAM

PIRIVU -KARPPU

ACTION - TONIC ,NUTRITIVE

GUNAM:

கூற்றென் றுரைக்குவிழிக் கோமளமே எப்போதும்
ஊற்றாம் பிரமியமும் உட்புண்ணும் ஆற்றபிலால்
வெட்டை அககடுப்பும் வீறி வரிற்றேற்றாங்
கொட்டைதனை நீயெடுத்துகொள்.குணப்பாடம்- மூலிகைவகுப்பு

NARSEERAGAM – *Cuminum cyminum*

SUVAI - INIPPU

THANMAI -THATPAM

PIRIVU -INIPPU

ACTION - Carminative,Stimulant,Stomachic,Astrigent

GUNAM:

பித்தமெனு மந்திரியைப் பின்னப் படுத்தியவன்
சத்துருவை யுந்துறந்து சாதித்து -மத்தனெனும்
ராசனையு மீவென்னு நன்பைப் பலப்படுத்தி
போசனகு டாரிசெயும் போர். குணப்பாடம்- மூலிகைவகுப்பு

KASAKASA - *Papaver somniferum*

SUVAI - INIPPU

THANMAI - VEPPAM

PIRIVU - INIPPU

ACTION - DEMULCENT,NUTRITIVE,ASTRIGENT

GUNAM:

கிருமி நமைச்சல் கிராணியதி சாரஞ்
சிரநீர் அநித்திரைபோஞ் செப்பில் -உருவழகுங்
காந்தியுமுண் டாகுங் கசகசா விங்குணத்தைத்
தேர்ந்தவர்கு விந்துவுமாந் தேர். குணப்பாடம்- மூலிகைவகுப்பு

LAVANGAPATTAI- Cinnamomum verum

SUVAI - KARPPU ,INIPPU

THANMAI -THATPAM

PIRIVU -INIPPU

ACTION -

STIMULANT,CARMINATIVE,APHRODISIAC

GUNAM:

தாதுநட்டம் பேதி சருவவிஷம் ஆகியநோய்
பூதகிர கஞ்சிலந்திப் பூச்சிவிடஞ் -சாதிவிடம்
ஆட்டுமிரைப் போடிருமல் ஆகியநோய்க் கூட்டமற
ஒட்டுமில வங்கத் துரி. குணப்பாடம்- மூலிகைவகுப்பு

VAALMUZHAGU*Piber cubeba*

SUVAI - KARPPU

THANMAI -VEPPAM

PIRIVU -KARPPU

ACTION -

STIMULANT,CARMINATIVE,DIURETIC,EXPECTORANT

GUNAM:

வாதபித்த ஐயம் வயிற்று வலிதாகஞ்
சீதம் பலநோய் சிதையுங்காண்-போத
அதிதீ பனமாம் அணங்கரசே நாளுந்
துதிவால் மிளகருந்தச் சொல் குணப்பாடம்- மூலிகைவகுப்பு

SAPJAVITHAI - *Ocimum basilicum*

SUVAI - INIPPU

THANMAI -THATPAM

PIRIVU -INIPPU

ACTION - DIURETIC,APHRODISIAC

GUNAM:

SAATHIKKAAI - *Myristica fragrans*

SUVAI - THUVARPPU,KAARPPU

THANMAI -VEPPAM

PIRIVU -KAARPPU

ACTION STIMULANT, CARMINATIVE, NARCOTIC, AROMATIC,APHRODISIAC, TONIC

GUNAM:

தாதுநட்டம் பேதி சருவாசி யஞ்சிர நோய்
ஓதுசுவா சங்காசம் உட்கிரணி வேதோ
டிலக்காய் வரும்பிணிபோம் ஏற்றமயல் பித்தங்
குலக்கா யருந்துவர்க்குக் கூறு குணப்பாடம்- மூலிகைவகுப்பு

SAATHIPATHRI -*Myristica fragrans*

SUVAI - KAARPPU,THUVARPPU

THANMAI -VEPPAM

PIRIVU -KAARPPU

ACTION -

APHRODISIAC,STIMULANT,CARMINATIVE

GUNAM:

சாதிதரும் பத்திரிக்குத தாபச் சுரந்தணியும்
ஓதுகின்ற பித்தம் உயருங்காண் -தாதுவிர்த்தி
யுண்டாங் கிரகணியோ டோதக் கழிச்சலறும்
பண்டாங் குறையோ பகார் குணப்பாடம்- மூலிகைவகுப்பு

M ELAGU - *Piper nigrum*

SUVAI - KAIPPU,KAARPPU

THANMAI - VEPPAM

PIRIVU - KAARPPU

ACTION -

ANTIDOTE,ANTIVATHA,RESOLVENT,ACRID

GUNAM:

சீதசுரம் பாண்டு சிலேத்துமங் கிராணிகுன்மம்
வாதம் அருசிபித்தம் மாமூலம்- ஓதுசன்னி
யாசம்பஸ் மாரம் அடன்மேகம் காசமிவை
நாசங் கறிமிளகினால் குணப்பாடம்- மூலிகைவகுப்பு

ESAPPUKOOL VITHAI –*Plantago ovate*

SUVAI - ---

THANMAI - ----

PIRIVU - ----

ACTION - DEMULCENT,DIURETIC,EMOLLIENT

PONAIKAN KUNGILIYAM- *Pistica lentiscus*

SUVAI -KAIPPU

THANMAI - VEPPAM

PIRIVU - KAARPU

ACTION - STOMACHIC,ASTRINGENT,REFRIGERANT

குணப்பாடம்- மூலிகைவகுப்பு

MADHULAI VITHAI- *Punica granatum*

SUVAI - INIPPU

THANMAI - THATPAM

PIRIVU - INIPPU

ACTION -APHRODISIAC,ASTRIGENT,TOENIFUE

GUNAM:

மாதுளைக் கனியுண மதனகா மேசுரத்
சூதென வாயுளர் சொல்லுவர் மிக்கவே குணப்பாடம்- மூலிகைவகுப்பு

NEERMULLI- *Hygrophila auriculata*

SUVAI - INIPPU,SIRUKAIPPU

THANMAI - THATPAM

PIRIVU - INIPPU

ACTION -APHRODISIAC,DIURETIC

GUNAM:

விந்துவுமாம் தாதுவுமாம் மேகரோகந்தொலையும்
உந்து மதிசாரம் ஒழியுங்காண் வந்துடலில்
ஏறியநீர் வீக்கம் இறங்கும் இளைப்புமறும்
கூறிய நீர்முள்ளிவிதைக் கு. குணப்பாடம்- மூலிகைவகுப்பு

THANNEERVITTAN KIZHANGU-*Asparagus racemosus*

SUVAI - INIPPU,

THANMAI - THATPAM

PIRIVU - INIPPU

ACTION -

APHRODISIAC,NUTRITIVE,ANTISPASMODIC

GUNAM:

நீரிழிவைப் போக்கும் நெடுநாட்சு ரத்தையெலாம்
ஊரைவிடுத் தோடவு ரைக்குங்காண்-நாரியரே ஆ
வெண்ணீர்பெய் சோமநோய் வெட்டை யனல்தணிக்குந்
தண்ணீர்விட் டாங்கிழங்கு தான்.

குணப்பாடம்- மூலிகைவகுப்பு

NILAPPANAI KIZHANGU-*Curculigo orchiodes*

SUVAI - INIPPU,

THANMAI - THATPAM

PIRIVU - INIPPU

ACTION -

TONIC,DIURETIC,ASTRIGENT,EMOLIENT

GUNAM:

மேக வனல்தணியும் வெண்குட்டந் தான்விலகும்
போக மிகவுமுறும் பொற்கொடியே-போகாத
சூலைமே கங்களோடு துன்னுகரும் புள்ளிம்போஞ்
சால நிலப்பனைகு தான்

OMAM-*Trachyspermum ammi*

SUVAI - KARPPU,SIRUKAPPU

THANMAI - VEPPAM

PIRIVU - KAARPPU

ACTION -HYPNOTIC, SEDATIVE,MILD

DIURETIC

GUNAM:

வெகுமூத் திரம்வாதம் வீரியநட் டம்புண்
உகுபேதி யுட்கடுப்பி நோடே-மிகுகரப்பான்
தீராக் கபமிவைபோம் செய்யகு ரோசானியென்றால்
வாரா மயக்கமுறு மால்

குணப்பாடம்- மூலிகைவகுப்பு

THIRATCHAI PAZHAM -*Vitis vinifera*

SUVAI -INIPPU

THANMAI -THATPAM

PIRIVU - INIPPU

ACTION -LAXATIVE,DIURETIC,NUTRITIVE

PERICHCHAN PAZHAM-*Phoenix dactylifera*

SUVAI - INIPPU

THANMAI - THATPAM

PIRIVU - KARPPU

ACTION -TONIC,NUTRITIVE,LAXATIVE,

GUNAM:

பேரீந்தெனுங்கனிக்குப் பித்தமத மூர்ச்சைசுரம்
நீரார்ந்த ஐயம் நெடுந்தாகம் -பேரர
இரத்தபித்த நீரிழிவி லைப்பறும் அரோசி
உரத்தமலக் கட்டுமறும் ஒது.

SARAPARUPPU-*Buchanania lanzan*

SUVAI - INIPPU

THANMAI - THATPAM

PIRIVU - INIPPU

ACTION -APHRODISIAC

GUNAM:

சாரப் பருப்பால் தனிமிசரி யின்பருப்பால்
நீரா பருங்கடுப்பு நீர்ச்சீதந்-தீரத்
தொலையுமிர தங்கந்தி துய்த்தார்க்கு நன்றாங்
கலையும்விந் துவுக்கூக்கங் காண்.

PADHAM PARUPPU-*Prunus dulcis*

SUVAI	- INIPPU
THANMAI	- THATPAM
PIRIVU	- INIPPU
ACTION	-APHRODISIAC

INGREDIENTS OF TRAIL DRUG

THETRANKOTTAI

NARSEERAGAM

KASAKASA

SATHIKAI

KUNGILIAM

ELAVANGAPATTAI

SARAPARUPU

VALMELGU

KARUNCHEERAGAM

NEERMULLI

MATHULAIVITHAI

SATHIPATHRI

MILAGU

NILAPANAI

OMAM

ULAR THIRATCHAI

SADHAVARI

PERACHAMPALAM

BADAM PARUPU

THETRAN ILAGAM

MATERIALS & METHODS

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MATERIALS AND METHODS

STUDY DESIGN:

Preclinical and Comparative Clinical trial of**AAN MALADU (Male Infertility)**was conducted at the **OPD** section of**, SIRAPPU MARUTHUVAM DEPARTMENT** attached to **AYOTHIDASS PANDITHAR HOSPITAL**, Chennai-47, during the
period of 2015-2018

The study was approved by Institutional Ethics Committee and the IEC approval no. **NIS/IEC/2016/11-13/ 14.10.2016** and the study was registered in CTRI and the registered no.**REF/2018/03/018682**

POPULATION AND SAMPLE:

The population consists of all patients satisfying the inclusion and exclusion criteria mentioned below. Sample consists of Aan maladu patients attending the OPD section of Sirappu Maruthuvam Department attached to Ayothidass pandithar Hospital, Chennai-47.

SAMPLE SIZE:

The trial size was 40 patients.

(Group –I : 20 patients Internal Medicine only)

(Group – II : 20 patients Internal Medicine along with Yogam therapy)

SUBJECT SELECTION:

Patients reporting with symptoms of inclusion criteria was subjected to screening test and documentation

INCLUSION CRITERIA:

- Male who doesn't have chance of conception for 1 year after Marriage with frequent unprotected sexual intercourse.
- Age :24-50yrs
- Sperm count ≤20 million/ml
- Motility ≤50%
- Patients with classical features of The W.H.O. criteria (1992) for semenogram.
- Patient willing to undergo Semen analysis &Routine blood investigation before and after treatment

- Willing to participate in trial and signing consent by fulfilling the condition of proforma.

EXCLUSION CRITERIA:

- Azoospermia
- Teratospermia
- Hydrocele
- Varicocele
- Diabetesmellitus
- Hypertension
- Cardiacdisease

WITHDRAWAL CRITERIA:

- Intolerance to the drug and development of any serious adverse effect during drug trial.
- Poor patient compliance & defaulters
- Patient unwilling to continue the course of clinical Study.
- Occurrence of any other systemic illness

DURATION OF TREATMENT:

45 days.

Herbal Drug Authentication : Certificate No:NISMB2932017

TESTS AND ASSESSMENTS:

I. Clinical assessment

II. Siddha system assessment

III. Routine investigations

I.**CLINICAL ASSESSMENT**:The initial assessment was done before the treatment . The assessment of therapy was made by adopting two parameters.

- **Semen Analysis**
- **Sexual Health Scoring**

1. **SEMEN ANALYSIS** – As per the recommendations of WHO (1992). [4] Collection of sample Masturbation was advised to all patients for method of collection. The sample was collected between 9-10 a.m. in case of coitus interrupts and it was delivered to laboratory within 20 minutes of the collection of semen.

2. **Examination of Semen**
3. **Volume**: Sample was measured by calibrated test tube and volume of semen was noted.
4. **pH**: pH was measured by comparing the standards pH paper colour changes
5. **Viscosity**: By lifting the glass rod from semen in test tube and on the basis of length of thread formation, the viscosity was scored as 0, 1, 2, 3. (4)
6. **Liquefaction time**: Liquefaction time (T) = T2 - T1 (T2 = Time observed till semen sample liquefies, T1= Time at the semen collection)
7. **Motility**: The spermatozoa were scanned systematically for 4 types of motility i.e. rapidly linear progressive, sluggishly linear progressive, nonprogressive and immotile.
8. **Viability**: For counting viable sperms eosin stain was used in laboratory.
9. **Gradation of Sperm count**:

   Severe Oligozoospermia < 5 mill / ml.

   Moderate Oligozoospermia > 5 and < 20 mill / ml

   Mild Oligozoospermia > 20 and < 40 mill / ml Normal > 40 mill / ml (9)
10. **Morphological evaluation**: Abnormal spermatozoa were counted like total abnormal forms and abnormality in head, mid piece, tail and headless spermatozoa.

SEXUAL HEALTH SCORING :

- The second objective parameter of assessment is sexual health parameters like sexual desire,
- erection, rigidity and orgasm. The scoring system developed by Mehra and Singh (1995)

Sexual Health Score		
Sexual Desire	No desire at all	0
	Lack of desire	1
	Desire but no activity	2
	Desire only on demand of the partner	3
	Normal desire	4
	Excess desire	5
Erection	No erection by any methods	0
	Erection with artificial methods	1
	Erection but unable to penetrate	2
	Initial difficulty but able to penetrate	3
	Erection with occasional failure	4
	Erection when ever desired	5
Rigidity	Unable to maintain erection or unable to continue sexual act	0
	Some case in erection but able to continue	1
	Sexual act to maintain erection and continue sexual act	2
Orgasm	No ejaculation at all	0
	Lack of enjoyment in most of occasions	1
	Enjoyment in 25% of sexual encounters	2
	Enjoyment in 50% of sexual act	3
	Enjoyment in 75% of sexual act	4
	Enjoyment in every sex act	5

TOTAL SOCORE=13

<u>Assessment of To improvement of Sexual quality life by Sex Health Score</u>

Increased sexual desire, erectile function, ejaculatory function, frequency, duration of coitus, getting orgasm or sexual satisfaction

0 - None	0-Nil
1- Slight	1-1%-9%
2- Moderate	2- 10%-29%
3-Good	3-30%-49%
4-Very good	
5-Excellent	4-50%-69%
	5-70%-89%
	6-90%-100%

EVALUATION OF CLINICAL PARAMETERS:

The history includes past, personal, family, occupation, dietary habits, seasonal history and associatedhistory.

Clinical investigation:

Blood:

TC, DC, ESR, Hb, VDRL, Sugar, Urea, Serum Creatinine, Cholesterol

Urine:

Albumin, Sugar, Deposit

SEMEN ANALYSIS

- The volume, colour, appearance of the SEMENsample
- Approximate number of total SPERMCELLS
- SPERM MOTILITY/ FORWARD PROGRESSION
- Percentage of sperm with NORMAL MORPHOLOGY &MOTILITY
- VISCOSITY ofsemen
- pH of the Seminalfluid
- Liquificationtime
- Antispermantibody

SIDDHA ASSESSMENT:

- EnvagaiThervugal
- Neerkuri
- Neikkuri

A case sheet format was prepared on the basis of the Siddha methodology example envagai thervugal, mukkutram, nilam, kaalam, udal thathugal, including neerkuri and neikuri. Individual case sheet was maintained for each patient at outpatient department.

Data collection forms:

Required information was collected from each patient by using following forms.

FormI : Screening and selection

proforma FormII: History takingproforma

Form III : Clinical assessment proforma/Sexual Heaith score Form

FormIV : Laboratory Investigation

FormV : Information sheet

FormVI : Drug Compliance form

FormVII : Consent form

FormVIII : Withdrawal form

FormIX : Diet Sheet

Form X : Adverse reaction

Data Analysis:

After enrolling the patients in the study a separate file for each patient was maintained and all forms was kept in the file. Whenever the patient visits OPD during the study period necessary entries were made in the assessment forms.

The data entries and adverse events if any was monitored by the Head of the Department.

Outcome of Treatment:

The outcome treatment is mainly assessed by comparing the reduction in clinical symptoms and recurrence before and after treatment and assessed by comparing the safety parameters before and after treatment

.

Adverse effect and Serious effect Management:

If the trial patient develops any adverse reactions the patient would referred to the Pharmacovigilance department of Nanju Maruthuvam and documented. For any adverse effect the investigator was given the proper management in the OPD.

Ethical issues:

1. Informed consent was obtained from the patient after explaining about the clinical trial in an understandable language.

2. After the consent of the patient (through consent) if they fit in the criteria they was enrolled in the study.

3. Treatment was provided free of cost.

4. Concomitant medicines were used if there is any need.

5. The patients who are excluded (as per the exclusion criteria) were referring to OPD.

Analysis of Trial medicine:

1. The acute and sub-Chronic toxicity study was carried out in National Institute of Siddha,Tambaram sanatorium Chennai-47
2. The Physiochemical analysis was performed in Noble Research Solutions, Chennai.
3. Observation made from patients with sign and symptoms of the disease and their prognosis were recorded.

NORMAL VALUES - WHO CRITERIA:

The WHO reference values for a normal semen analysis are defined as given Below.

- Volume – 2 ml or more
- Total sperm count - 20 million per ejaculate or
- Spermconcentration - 20 million per
- ejaculate or more pH – 7.2 or higher Motility -

50 % or more motile

- 25% or more with progressive motility, within 60 minutes of

ejaculation Motility is graded from a to d according to WHO manual criteria,

– a Fast progressive. Sperms are those which swim forward fast in a straight line, like guidedmissiles

– Slowprogressive.

Sperms swim forward, but either in a curved or crooked line or slowly. c

– Non progressive.

Sperms move their tails, but do not move forward. (local motility only)

– Immotile. Sperms do not move atall.Sperms of grade c & d are considered poor.

MORPHOLOGY:

- Head - The head should be oval and smooth.
- Mid piece - the mid piece should be straight and slightly thicker

than the tail.

- Tail - the tail should be single, unbroken, straight and without coi

Outcome of Treatment

The outcome treatment is mainly assessed to improve the sperm count at least 20% and Sexual Health Score by comparing the reduction in clinical symptoms and recurrence before and after treatment and assessed by comparing the safety parameters before and aftertreatment.

Adverse effect and Serious effect Management:

If the trial patient develops any adverse reactions the patient was referred to the Pharmacovigilance department of Nanju Maruthuvam National Institute of Siddha and documented. For any adverse effect the investigator will give the proper management in theOPD.

Ethical issues

1. Informed consent was obtained from the patient after explaining about the clinical trial in an understandablelanguage.
2. After the consent of the patient (through consent) if they fit in the criteria they was enrolled in thestudy.
3. Treatment was provided free ofcost.
4. Concomitant medicines was used if there is anyneed.
5. The patients who are excluded (as per the exclusion criteria) was referring to OPD.

Analysis of Trial medicine:

1. The acute and sub-Chronic toxicity study was carried out in National Institute of Siddha ,Chennai-47
2. The physiochemical analysis was performed in Noble Research Solutions Chennai
3. Observation made from patients with sign and symptoms of the disease and their prognosis wererecorded.

RESULTS AND OBSERVATION

RESULTS AND OBSERVATION

The study on Aan maladu was carried out in 40 patients in the Department of Sirappu Maruthuvam, National Institute of Siddha, Chennai-47 attached to Ayothidass Pandithar Hospital during 2016-2018 were analysed. The observation were made and tabulated with following criteria.

- AgeDistribution
- Kaalam
- Thinai
- Occupationalstatus
- Socio economicstatus
- Foodhabits
- Personalhabits
- Symptoms
- Mukkutram- Vaatham, Pitham, Iyyam
- Ezhu UdalKattugal
- EnvagaiThervugal
- Naadi
- Neikuri
- Clinical Progress
- SemenAnalysis
- Sexual Health Score
- Grading ofResults

BEFORE TREATMENT (GROUP I MEDICINE ONLY)

TC- Total Count, DC- Differential Count, P- Polymorph, L- Lymphocytes, E- Eosinophil, HB- Haemoglobin, ESR- Erythrocytes Sedimentation Rate, Alb- Albumin, Sug- Sugar, Dep- Deposits, OPC- Occasional Pus Cells, OEC- Occasional Epithelial Cells, FPC- Few Pus Cells

S.No.	OP.No.	Age	HEMATOLOGICAL REPORT						URINE ANALYSIS			STOOL EXAMINATION	
			Tc Cu/mm	D c			ES R	Hb (Gm.)	Alb	Sug	Dep	Ova	Cys t
				P	L	E	1/2hr	1 hr.					
1.	I75584	39	9700	45	32	3	2	5	14	Nil	Nil	OPC	Nil	Nil
2.	J21944	26	9300	57	33	5	5	5	12.8	Nil	Nil	OPC	Nil	Nil
3.	J73812	33	9400	58	42	6	10	5	12.5	Nil	Nil	OPC	Nil	Nil
4.	J99050	37	10600	57	36	2	7	15	13	Nil	Nil	OPC	Nil	Nil
5.	J44749	40	9400	48	35	7	8	17	14,8	Nil	Nil	OPC	Nil	Nil
6.	H88868	27	10700	58	30	4	15	25	11.9	Nil	Nil	OPC	Nil	Nil
7.	J91432	32	9700	55	41	2	6	18	13.3	Nil	Nil	OPC	Nil	Nil
8.	J89161	31	9800	66	39	8	7	10	12	Nil	Nil	FPC	Nil	Nil
9.	J35031	42	10300	60	30	4	8	15	14	Nil	Nil	OPC	Nil	Nil
10.	J14466	34	10200	57	37	6	10	20	14.8	Nil	Nil	OEC	Nil	Nil
11.	F99587	36	9200	62	42	3	5	8	12.9	Nil	Nil	OPC	Nil	Nil
12.	J92651	34	9500	49	37	2	2	5	13	Nil	Nil	OPC	Nil	Nil
13.	J51711	34	9600	51	32	5	6	10	11	Nil	Nil	FPC	Nil	Nil
14.	K03734	42	8900	58	36	4	5	8	15	Nil	Nil	OEC	Nil	Nil
15.	J95223	34	9300	55	34	6	5	8	12.7	Nil	Nil	OPC	Nil	Nil
16.	H52513	27	10500	60	42	6	9	18	13.9	Nil	Nil	OPC	Nil	Nil
17.	J87368	30	8700	52	40	7	15	25	15	Nil	Nil	OPC	Nil	Nil
18.	J92653	30	9600	67	38	8	10	20	14.4	Nil	Nil	Nil	Nil	Nil
19.	J92647	33	9600	58	37	3	12	25	12.7	Nil	Nil	Nil	Nil	Nil
20.	J45803	33	9800	57	35	2	8	15	14.2	Nil	Nil	Nil	Nil	Nil

AFTER TREATMENT (GROUP – I MEDICINE ONLY)

S.No.	OP.No.	Age	HEMATOLOGICAL REPORT							URINE ANALYSIS			STOOL EXAMINATION	
			Tc Cu/mm	D c			ESR		Hb (Gm.)	Alb	Sug	Dep	Ova	Cyst
				P	L	E	1/2hr	1 hr.						
1.	I75584	30	9800	55	36	3	3	6	14.8	Nil	Nil	Nil	Nil	Nil
2.	J21944	30	9700	57	38	4	3	8	13.8	Nil	Nil	OPC	Nil	Nil
3.	J73812	27	9800	60	42	6	9	10	12.9	Nil	Nil	Nil	Nil	Nil
4.	J99050	30	10600	59	39	5	7	15	13.7	Nil	Nil	OPC	Nil	Nil
5.	J44749	51	9700	55	40	8	4	10	14.8	Nil	Nil	Nil	Nil	Nil
6.	H88868	30	10700	60	35	4	10	18	13.9	Nil	Nil	FPC	Nil	Nil
7.	J91432	35	10100	58	41	3	6	12	13.4	Nil	Nil	Nil	Nil	Nil
8.	J89161	34	9800	66	40	8	6	10	12.8	Nil	Nil	Nil	Nil	Nil
9.	J35031	44	10300	60	34	3	8	16	14	Nil	Nil	OPC	Nil	Nil
10.	J14466	30	10200	55	39	6	10	18	14.8	Nil	Nil	Nil	Nil	Nil
11.	F99587	33	9600	62	45	3	3	8	13	Nil	Nil	Nil	Nil	Nil
12.	J92651	27	10200	54	38	2	2	6	13.2	Nil	Nil	Nil	Nil	Nil
13.	J51711	21	9700	51	37	8	5	9	12	Nil	Nil	Nil	Nil	Nil
14.	K03734	35	9100	58	36	4	3	8	15	Nil	Nil	Nil	Nil	Nil
15.	J95223	30	9600	59	40	6	2	8	14	Nil	Nil	Nil	Nil	Nil
16.	H52513	37	10500	60	42	6	9	18	14	Nil	Nil	OPC	Nil	Nil
17.	J87368	34	9700	60	40	3	15	20	15	Nil	Nil	Nil	Nil	Nil
18.	J92653	32	9600	67	37	8	10	18	14.4	Nil	Nil	Nil	Nil	Nil
19.	J92647	27	9800	58	39	3	8	15	13.8	Nil	Nil	Nil	Nil	Nil
20.	J45803	30	9700	62	36	2	5	10	15	Nil	Nil	Nil	Nil	Nil

BEFORE TREATMENT (GROUP II MEDICINE WITH YOGAM THERAPY

S.No. -	OP.No.	Age	HEMATOLOGICAL REPORT							URINE ANALYSIS			STOOL EXAMINATION	
			Tc Cu/mm	Dc			ESR		Hb (Gm.)	Alb	Sug	Dep	Ova	Cyst
				P	L	E	1/2hr	1 hr.						
1.	I95862	31	9900	55	36	3	3	6	14.8	Nil	Nil	Nil	Nil	Nil
2.	K01853	37	9600	57	38	4	3	8	13.8	Nil	Nil	OPC	Nil	Nil
3.	H71796	32	9700	60	42	6	9	10	12.9	Nil	Nil	Nil	Nil	Nil
4.	I77003	31	10100	59	39	5	7	15	13.7	Nil	Nil	OPC	Nil	Nil
5.	I81689	32	9800	55	40	8	4	10	14.8	Nil	Nil	Nil	Nil	Nil
6.	H14287	37	10500	60	35	4	10	18	13.9	Nil	Nil	FPC	Nil	Nil
7.	J32737	37	9900	58	41	3	6	12	13.4	Nil	Nil	Nil	Nil	Nil
8.	K04023	41	9600	66	40	8	6	10	12.8	Nil	Nil	Nil	Nil	Nil
9.	K06217	30	10400	60	34	3	8	16	14	Nil	Nil	OPC	Nil	Nil
10.	J92655	37	10200	55	39	6	10	18	14.8	Nil	Nil	Nil	Nil	Nil
11.	J33777	34	9700	62	45	3	3	8	13	Nil	Nil	Nil	Nil	Nil
12.	J89599	38	10200	54	38	2	2	6	13.2	Nil	Nil	Nil	Nil	Nil
13.	J41481	27	9700	51	37	8	5	9	12	Nil	Nil	Nil	Nil	Nil
14.	K14518	33	9200	58	36	4	3	8	15	Nil	Nil	Nil	Nil	Nil
15.	I69657	38	9900	59	40	6	2	8	14	Nil	Nil	Nil	Nil	Nil
16.	J41481	26	9700	60	42	6	9	18	14	Nil	Nil	OPC	Nil	Nil
17.	K01067	42	9900	60	40	3	15	20	15	Nil	Nil	Nil	Nil	Nil
18.	J95313	29	9800	67	37	8	10	18	14.4	Nil	Nil	Nil	Nil	Nil
19.	F03268	38	10200	58	39	3	8	15	13.8	Nil	Nil	Nil	Nil	Nil
20.	K18433	32	9600	62	36	2	5	10	15	Nil	Nil	Nil	Nil	Nil

AFTER TREATMENT (GROUP II MEDICINE WITH YOGAM THERAPY

S.No.	OP.No.	Age	HEMATOLOGICAL REPORT						URINE ANALYSIS			STOOL EXAMINATION	
			Tc	Dc			ESR		Hb	Alb	Sug	Dep	Ova	Cyst
			Cu/mm	P	L	E	1/2hr	1 hr.	(Gm.)					
1.	I95862	31	9700	45	32	3	2	5	14	Nil	Nil	OPC	Nil	Nil
2.	K01853	37	9300	57	33	5	5	5	12.8	Nil	Nil	OPC	Nil	Nil
3.	H71796	32	9400	58	42	6	10	5	12.5	Nil	Nil	OPC	Nil	Nil
4.	I77003	31	10600	57	36	2	7	15	13	Nil	Nil	OPC	Nil	Nil
5.	I81689	32	9400	48	35	7	8	17	14,8	Nil	Nil	OPC	Nil	Nil
6.	H14287	37	10700	58	30	4	15	25	11.9	Nil	Nil	OPC	Nil	Nil
7.	J32737	37	9700	55	41	2	6	18	13.3	Nil	Nil	OPC	Nil	Nil
8.	K04023	41	9800	66	39	8	7	10	12	Nil	Nil	FPC	Nil	Nil
9.	K06217	30	10300	60	30	4	8	15	14	Nil	Nil	OPC	Nil	Nil
10.	J92655	37	10200	57	37	6	10	20	14.8	Nil	Nil	OEC	Nil	Nil
11.	J33777	34	9200	62	42	3	5	8	12.9	Nil	Nil	OPC	Nil	Nil
12.	J89599	38	9500	49	37	2	2	5	13	Nil	Nil	OPC	Nil	Nil
13.	J41481	27	9600	51	32	5	6	10	11	Nil	Nil	FPC	Nil	Nil
14.	K14518	33	8900	58	36	4	5	8	15	Nil	Nil	OEC	Nil	Nil
15.	I69657	38	9300	55	34	6	5	8	12.7	Nil	Nil	OPC	Nil	Nil
16.	J41481	26	10500	60	42	6	9	18	13.9	Nil	Nil	OPC	Nil	Nil
17.	K01067	42	8700	52	40	7	15	25	15	Nil	Nil	OPC	Nil	Nil
18.	J95313	29	9600	67	38	8	10	20	14.4	Nil	Nil	Nil	Nil	Nil
19.	F03268	38	9600	58	37	3	12	25	12.7	Nil	Nil	Nil	Nil	Nil
20.	K18433	32	9700	62	36	2	5	10	15	Nil	Nil	Nil	Nil	Nil

GROUP I (MEDICINE ONLY) OPD PATIENTS BEFORE TREATMENT AND AFTER TREATMENT

SL. NO.	OP.NO.	AGE	SEMEN ANALYSIS BEFORE TREATMENT	SEMEN ANALYSIS AFTERTREATMENT	TOTAL NO. OF DAYS	RESULT
1.	I75584	30	TSC – 13million/cu mm AM-20 %	TSC – 50million/cu mm AM- 35%	45 Days	Good Improvement
2.	J21944	30	TSC –17 million/cu mm AM- 15%**	TSC – 50million/cu mm AM- 30%	45 Days	GoodImprovement
3.	J73812	27	TSC – 4million/cu mm AM-20 %	TSC –10 million/cu mm AM-30 %	45 Days	Poor Improvement
4.	J99050	30	TSC –20 million/cu mm AM-20 %	TSC –70 million/cu mm AM- 48%	45 Days	GoodImprovement
5.	J44749	50	TSC –08 million/cu mm AM-8 %**	TSC – 17million/cu mm AM-25 %	45 Days	Moderate Improvement
6.	H88868	30	TSC –20 million/cu mm AM- 10%	TSC – 60million/cu mm AM- 40%	45 Days	GoodImprovement
7.	J91432	35	TSC –15 million/cu mm AM-5 %	TSC – 60million/cu mm AM- 50%	45 Days	GoodImprovement
8.	J89161	34	TSC –17 million/cu mm AM- 07%	TSC – 25million/cu mm AM- 15%	45 Days	Poor Improvement
9.	J35031	44	TSC – .08million/cu mm AM- 24%	TSC –15 million/cu mm AM- 25%	45 Days	PoorImprovement

10.	J14466	30	TSC –12.7 million/cu mm AM-22%	TSC –70 million/cu mm AM-45 %	45 Days	GoodImprovement
11.	F99587	33	TSC –5 million/cu mm AM- 8%	TSC –19 million/cu mm AM-22 %	45 Days	Moderate Improvement
12.	J92651	27	TSC – 4million/cu mm AM- 10%	TSC – 14million/cu mm AM- 50%	45 Days	Poor Improvement
13.	J51711	21	TSC – 22million/cu mm AM- 10%	TSC – 35million/cu mm AM- 40%	45 Days	Moderate Improvement
14.	K03734	35	TSC –12 million/cu mm AM-15 %	TSC – 15million/cu mm AM- 20%	45 Days	Poor Improvement
15.	J95223	30	TSC –2 million/cu mm AM- 7%	TSC –60 million/cu mm AM-35 %	45 Days	Good Improvement
16.	H52513	37	TSC –14 million/cu mm AM-10 %	TSC –35 million/cu mm AM-44 %	45 Days	Moderate Improvement
17.	J87368	34	TSC – 30million/cu mm AM- 15 %	TSC –45 million/cu mm AM-30 %	45 Days	Good Improvement
18.	J92653	32	TSC –7.15 million/cu mm AM- 10 %	TSC –55 million/cu mm AM- 25%	45 Days	Moderate Improvement
19.	J92647	27	TSC –15 million/cu mm AM- 8 %	TSC –42 million/cu mm AM-22 %	45 Days	Moderate Improvement
20.	J45803	30	TSC –11.7 million/cu mm AM- 8.5 %	TSC –40 million/cu mm AM- 35%	45 Days	Good Improvement

GROUP II (MEDICINE WITH YOGAM THERAPY) OPD PATIENTS BEFORE TREATMENT AND AFTER TREATMENT

SL. NO.	OP.NO.	AGE	SEMEN ANALYSIS BEFORE TREATMENT	SEMEN ANALYSIS AFTERTREATMENT	TOTAL NO. OF DAYS	RESULT
1.	I95862	31	TSC – 13million/cu mm AM-20 %	TSC – 50million/cu mm AM- 55%	45 Days	Good Improvement
2.	K01853	37	TSC –12 million/cu mm AM- 15%**	TSC – 70million/cu mm AM- 60%	45 Days	GoodImprovement
3.	H71796	32	TSC – 4million/cu mm AM-20 %	TSC –10 million/cu mm AM-50 %	45 Days	Poor Improvement
4.	I77003	31	TSC –10 million/cu mm AM-20 %	TSC –70 million/cu mm AM- 58%	45 Days	GoodImprovement
5.	I81689	32	TSC –18 million/cu mm AM-8 %**	TSC – 70million/cu mm AM-55 %	45 Days	Good Improvement
6.	H14287	37	TSC –20 million/cu mm AM- 10%	TSC – 60million/cu mm AM- 60%	45 Days	GoodImprovement
7.	J32737	37	TSC –15 million/cu mm AM-5 %	TSC – 60million/cu mm AM- 50%	45 Days	GoodImprovement
8.	K04023	41	TSC –17 million/cu mm AM- 07%	TSC – 24million/cu mm AM- 25%	45 Days	Poor Improvement

9.	K06217	30	TSC – 19million/cu mm AM- 24%	TSC –59 million/cu mm AM- 53%	45 Days	GoodImprovement
10.	J92655	37	TSC –12.7 million/cu mm AM-22%	TSC –70 million/cu mm AM-65 %	45 Days	GoodImprovement
11.	J33777	34	TSC –5 million/cu mm AM- 8%	TSC –27 million/cu mm AM-22 %	45 Days	Moderate Improvement
12.	J89599	38	TSC – 4million/cu mm AM- 10%	TSC – 14million/cu mm AM- 50%	45 Days	Poor Improvement
13.	J41481	27	TSC – 22million/cu mm AM- 10%	TSC – 35million/cu mm AM- 47%	45 Days	Moderate Improvement
14.	K14518	33	TSC –25 million/cu mm AM-35 %	TSC – 75million/cu mm AM- 50%	45 Days	Good Improvement
15.	I69657	38	TSC –2 million/cu mm AM- 7%	TSC –60 million/cu mm AM-35 %	45 Days	Good Improvement
16.	J41481	26	TSC –14 million/cu mm AM-32 %	TSC –105 million/cu mm AM-54 %	45 Days	Good Improvement
17.	K01067	42	TSC – 30million/cu mm AM- 15 %	TSC –45 million/cu mm AM-30 %	45 Days	Good Improvement
18.	J95313	29	TSC –7.15 million/cu mm AM- 10 %	TSC –60 million/cu mm AM- 58%	45 Days	Good Improvement
19.	F03268	38	TSC –15 million/cu mm AM- 8 %	TSC –42 million/cu mm AM-29 %	45 Days	Moderate Improvement
20.	K18433	32	TSC –11.7 million/cu mm AM- 8.5 %	TSC –90 million/cu mm AM- 57%	45 Days	Good Improvement

SEXUAL HEALTH SCORE

The scoring system developed by Mehra and Singh (1995)

GROUP-I (MEDICINE ONLY)

S.No.	OP.No.	Age	SHC 13/13	
			BT	AT
1.	I75584	30	7	9
2.	J21944	30	9	10
3.	J73812	27	6	9
4.	J99050	30	5	8
5.	J44749	50	4	6
6.	H88868	30	5	8
7.	J91432	35	8	7
8.	J89161	34	4	6
9.	J35031	44	2	6
10.	J14466	30	8	9
11.	F99587	33	6	11
12.	J92651	27	10	11
13.	J51711	27	9	9
14.	K03734	35	5	7
15.	J95223	30	8	10
16.	H52513	37	7	9
17.	J87368	34	5	7
18.	J92653	32	4	6
19.	J92647	27	7	9
20.	J45803	30	7	11

GROUP-II (MEDICINE WITH YOGAM THERAPY)

S.No.	OP.No.	Age	SHC 13/13	
			BT	AT
1.	I95862	31	5	10
2.	K01853	37	7	12
3.	H71796	32	5	10
4.	I77003	31	8	12
5.	I81689	32	9	12
6.	H14287	37	4	7
7.	J32737	37	5	10
8.	K04023	41	7	12
9.	K06217	30	6	12
10.	J92655	37	8	11
11.	J33777	34	6	12
12.	J89599	38	5	10
13.	J41481	27	5	9
14.	K14518	33	3	9
15.	I69657	38	6	10
16.	J41481	26	6	12
17.	K01067	42	6	9
18.	J95313	29	8	12
19.	F03268	38	6	11
20.	K18433	32	8	12

GROUP I (MEDICINE ONLY) OPD PATIENTS
SEMEN ANALYSIS

Sl. No	Result	No of cases 20	Percentage
1	Good	9	45%
2	Moderate	6	30%
3	Poor	5	25%

Observation:

Among 20 cases 9cases were good improvement, 6 cases were moderate improvement, 5 cases Poor improvement.

GROUP II (MEDICINE ALONG WITH YOGAM THERAPY) OPD PATIENTS
SEMEN ANALYSIS

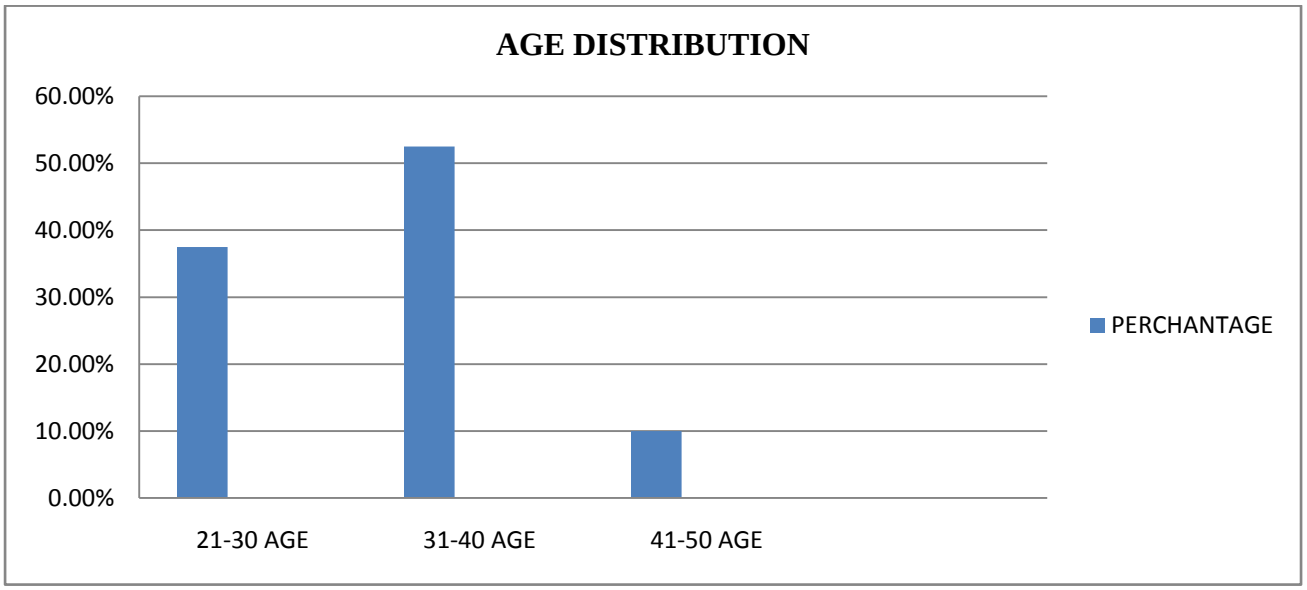
Sl. No	Result	No of cases 20	Percentage
1	Good	14	70%
2	Moderate	3	15%
3	Poor	3	15%

Observation:

Among 20 cases 14 cases were good improvement, 3 cases were moderate improvement, 3 cases Poor improvement.

Age Distribution:

Sl. No	Age	No. of Patients/40	Percentage
1.	21-30	15	37.5%
2.	31-40	21	52.5%
3.	41-50	2	10%

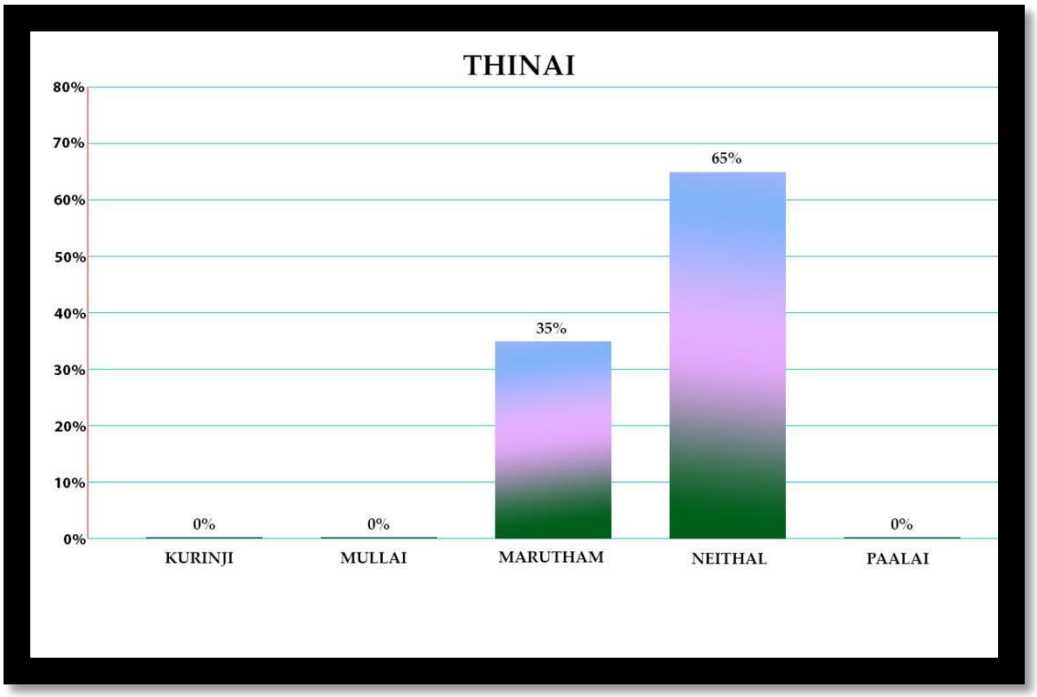


Inference:

According to the above mentioned data 37.5% of patients were in age group 21- 30 years, 52.5% of patients were in age group 31-40 years and 10% of patients were in age group 41-50 years.

Thinai:

Sl. No	Thinai	No. of Patients/40	Percentage
1	Kurinji	0	0%
2	Mullai	0	0%
3	Marutham	14	35%
4	Neithal	26	65%
5	Paalai	0	0%

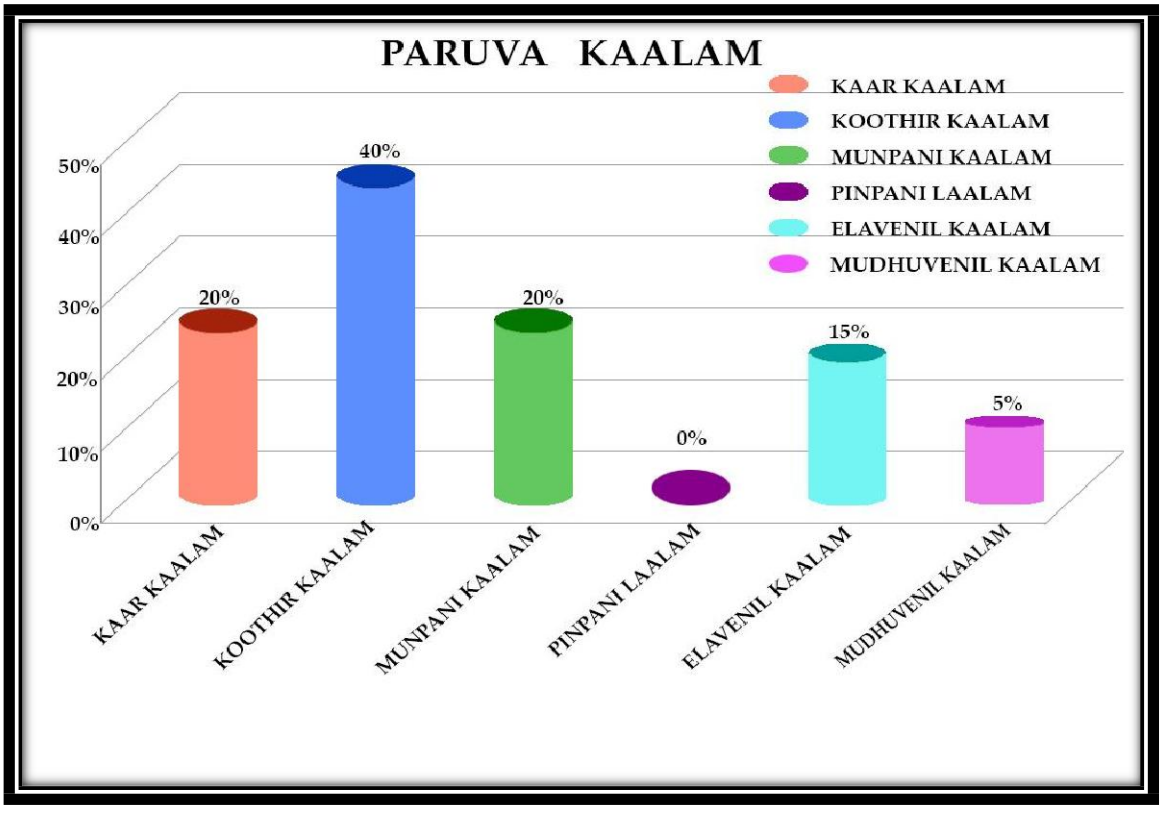


Inference:

According to the above mentioned data 65% of patients were from Neithal, and 35% of patients were from Marutham.

Paruva kaalam:

Sl. No	Paruva kaalam	Months	No. of Patients/ 40	Percentage
1.	Kaar kaalam	Avani, puratasi (Mid Aug- Mid Oct)	8	20%
2.	Koothir kaalam	Iyppasi, Kaarthigai (Mid Oct- Mid Dec)	16	40%
3.	Munpani kaalam	Margazhi, Thai (Mid Dec- Mid Feb)	8	20%
4.	Pinpani kaalam	Maasi, Panguni (Mid Feb- Mid April)	0	0%
5.	Elavenil kaalam	Chithirai, Vaigasi (Mid April- Mid June)	6	15%
6.	Mudhuvenil kaalam	Aani, Aadi (Mid June- Mid Aug)	2	5%

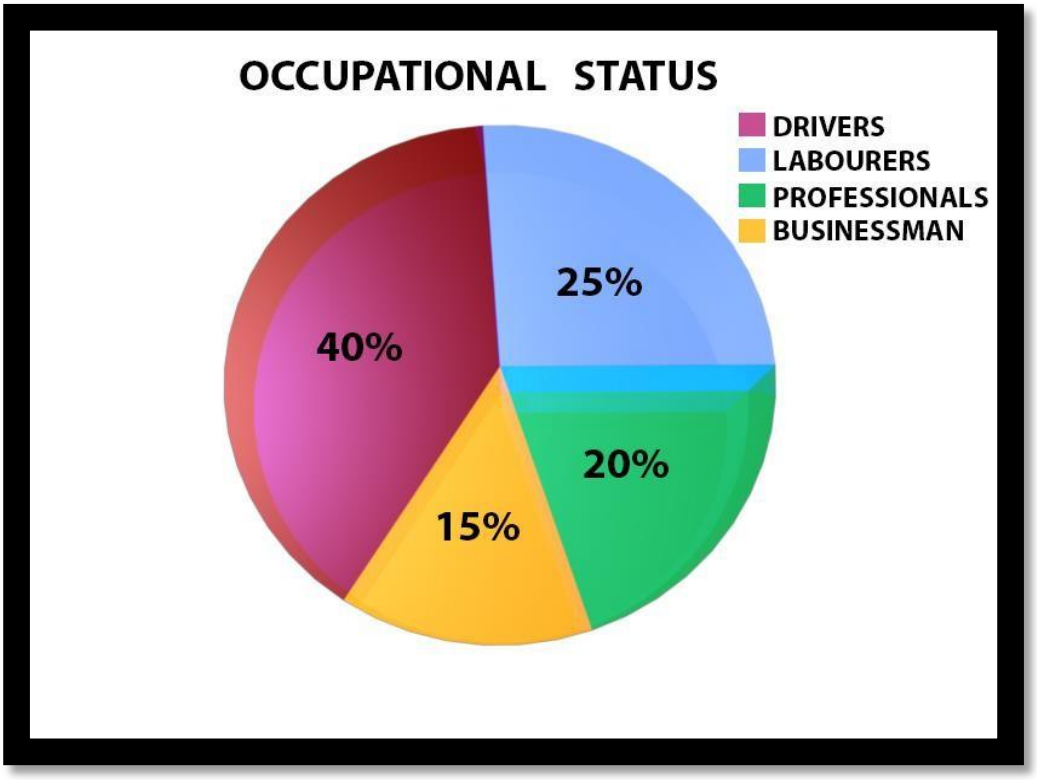


Inference:

40% of cases came in Koothir kaalam, 20% of cases in Kaar kaalam & Munpani kaalam, 15% of cases came in Elavenil kaalam and 5% cases in Mudhuvenil kaalam

Occupational Status:

Sl. No	Occupational Status	No. ofPatients/40	Percentage
1.	Drivers	16	40%
2.	Labourers	10	25%
3.	Professionals	8	20%
4.	Businessman	6	15%

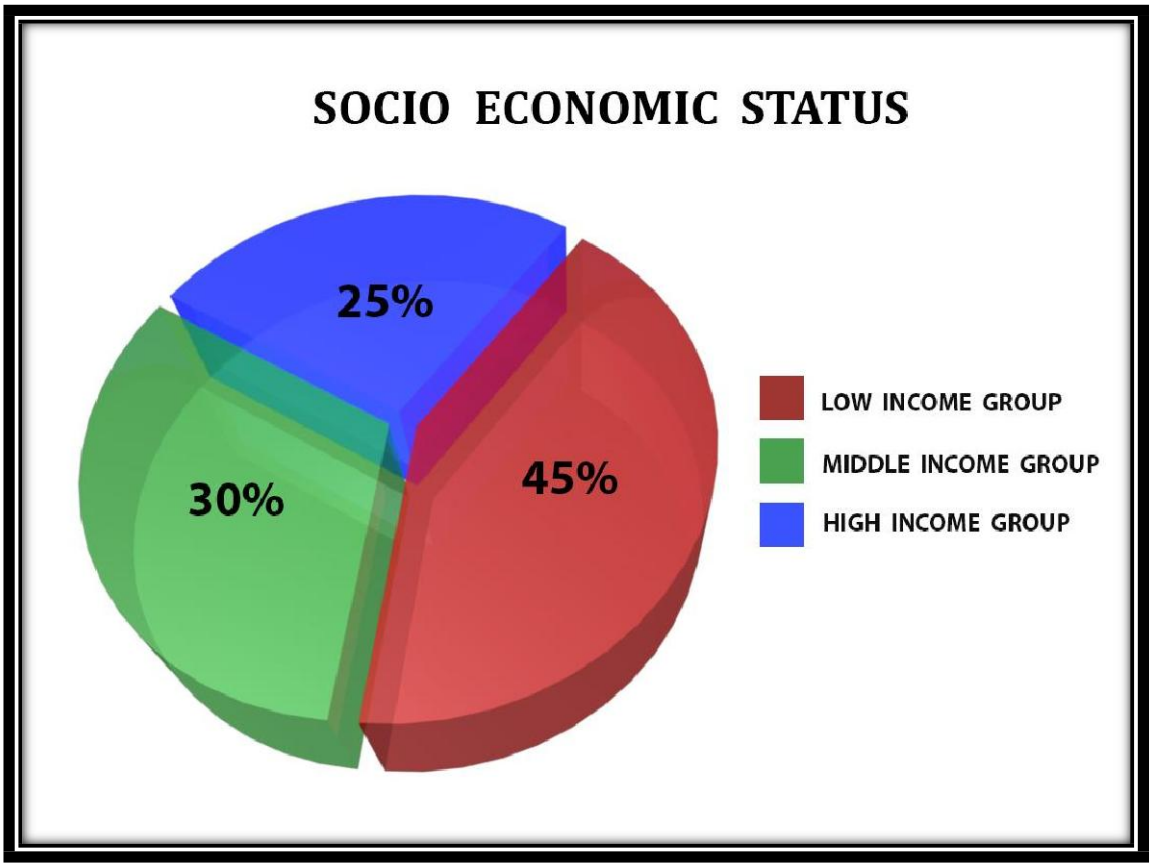


Inference:

40% of cases were Drivers, 25% of cases were Labourers, 20% of cases were Professionals and 15% of cases were Businessman.

Socio Economic Status:

Sl. No	Socio Economic Status	No. of Patients/40	Percentage
1.	Low income group (below 25000/ Month)	18	45%
2.	Middle income group (25000-50000/ Month)	12	30%
3.	High income group (above 50000/ Month)	10	25%

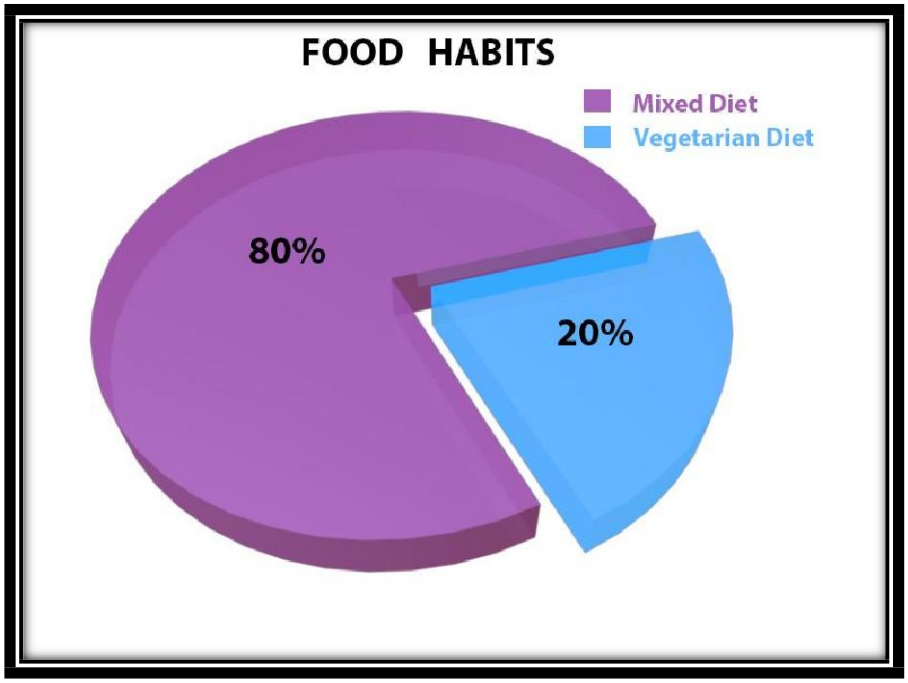


Inference:

45% of patients belong to low income group, 30% of patients belongs to middle income group and 25% of patients belongs to high income group.

Food Habits:

Sl. No	Food Habits	No. ofPatients/40	Percentage
1.	Vegetarian Diet	08	20%
2.	Mixed Diet	32	80%



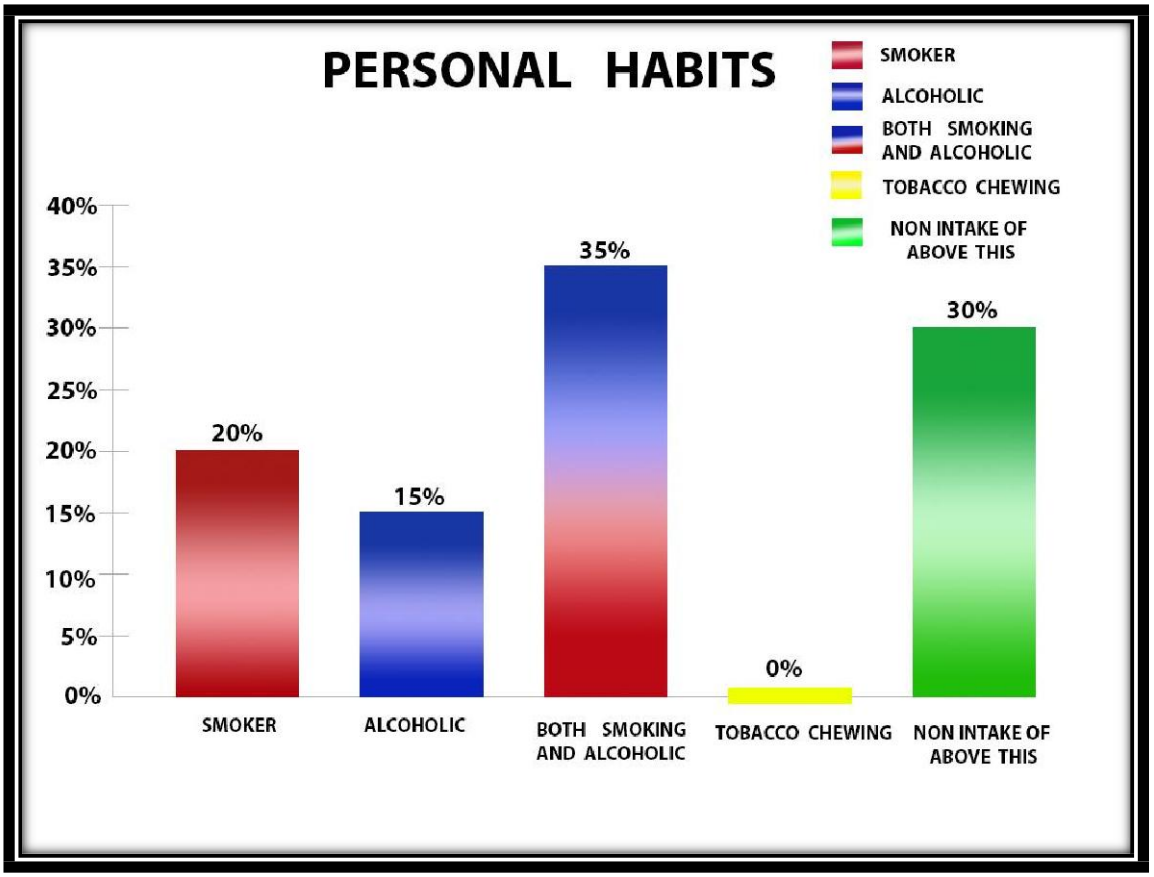
Inference:

80% of patients were mixed diet (including non-vegetarian)

20% of patients were vegetarian.

Personal Habits:

Sl. No	Personal Habits	No. ofPatients/40	Percentage
1.	Smoker	08	20%
2.	Alcoholic	06	15%
3.	Both smoker and alcoholic	14	35%
4.	Tobacco chewing	0	0%
5.	Non intake of the above	12	30%



Inference:

35% of cases were both smokers and alcoholic,

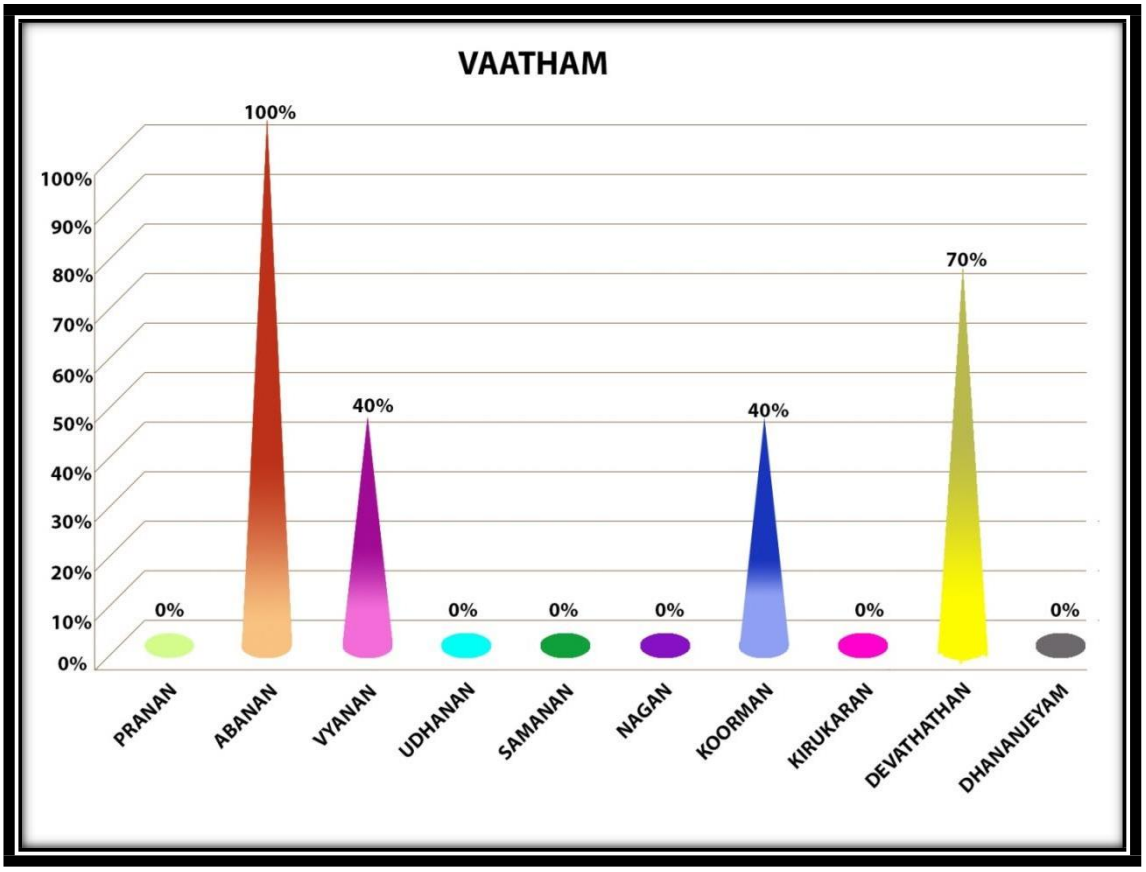
20% of cases werealcoholic

15% of cases werealcoholic

And 30% of cases were None of the above habits

Vaatham:

Sl. No	Vaatham	No. of Patients/40	Percentage
1.	Pranan	0	0%
2.	Abanan	20	100%
3.	Vyanan	6	30%
4.	Udhanan	0	0%
5.	Samanan	0	0%
6.	Nagan	0	0%
7.	Koorman	8	40%
8.	Kirukaran	0	0%
9.	Devathathan	14	70%
10.	Dhananjeyan	0	0%

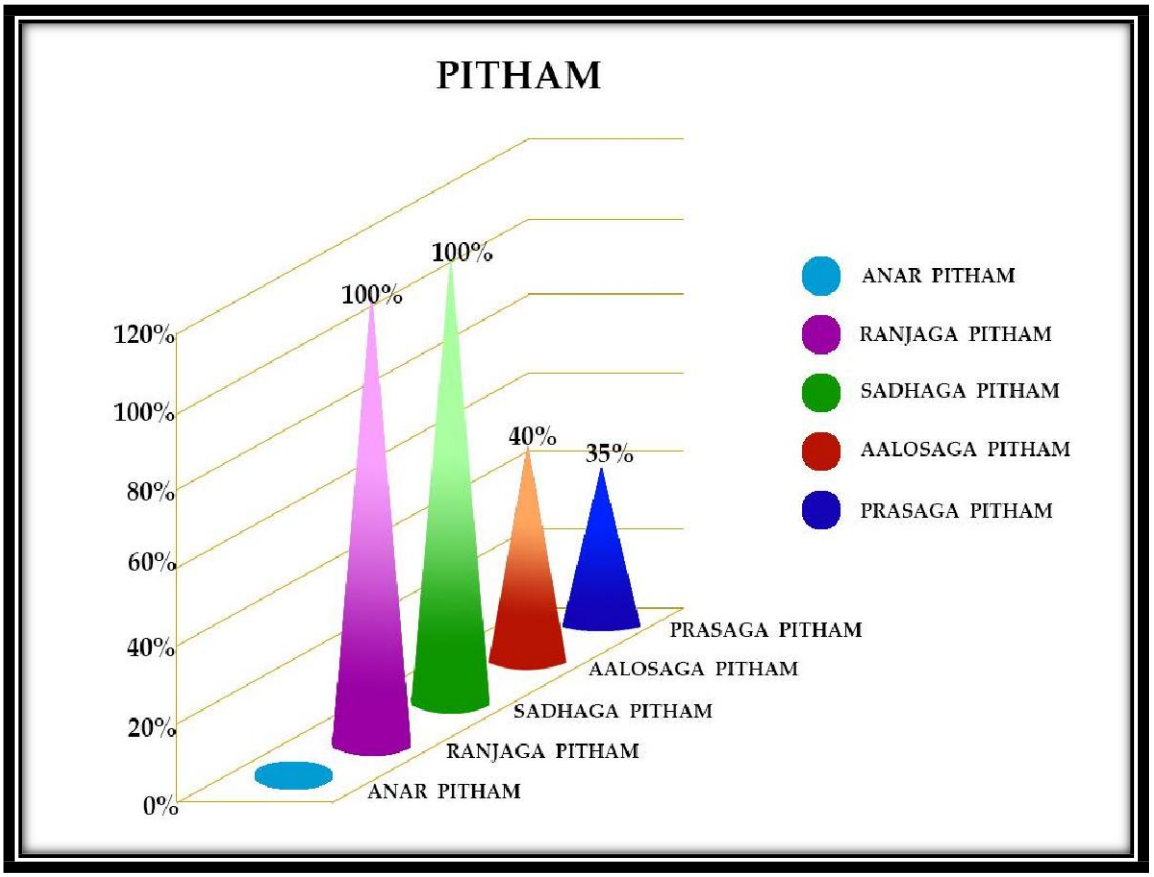


Inference:

Abanan was affected in 100% of patients, koorman was affected in 40% of patients and vyanan was affected in 30% of patients, Devathathan was affected in 70% of patients.

Pitham:

Sl. No	Pitham	No. of Patients/40	Percentage
1.	Anar Pitham	0	0%
2.	Ranjaga Pitham	10	100%
3.	Sadhaga Pitham	10	100%
4.	Aalosaga Pitham	04	40%
5.	Prasaga Pitham	03	35%

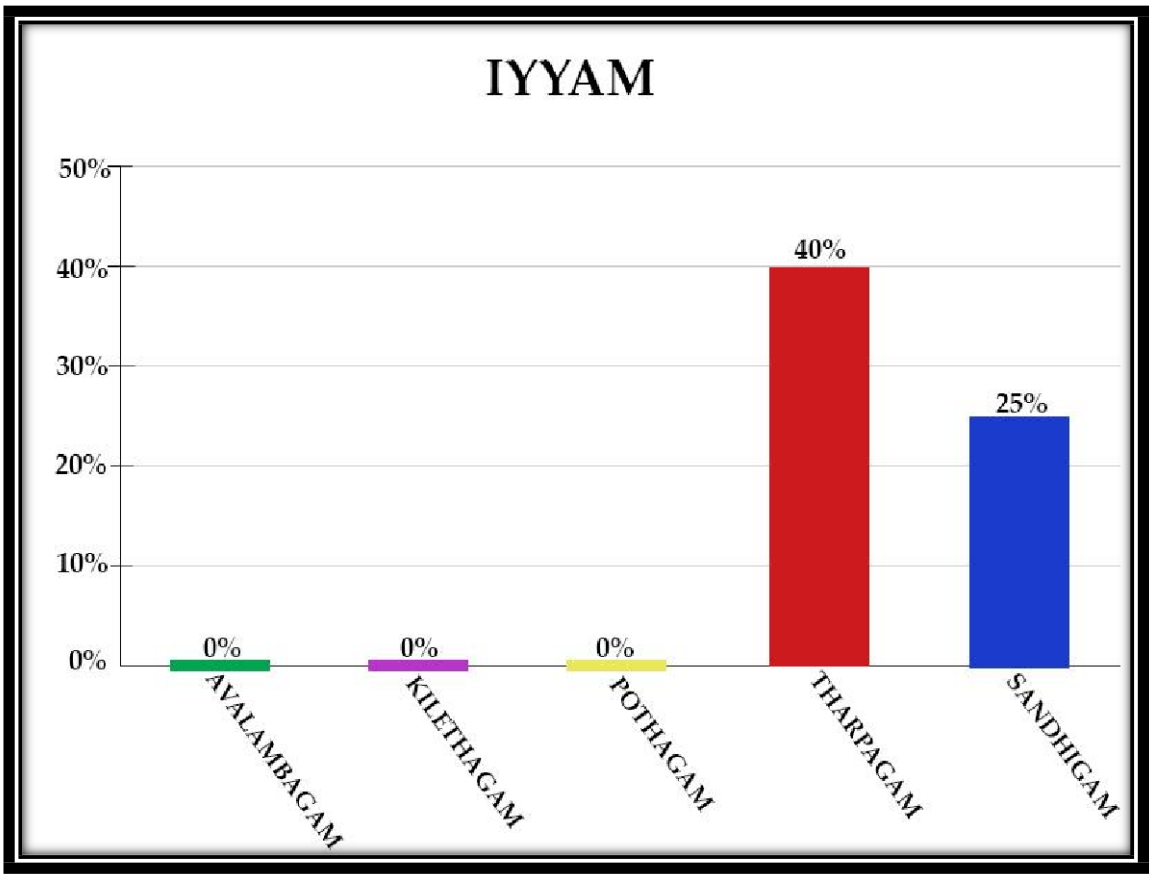


Inference:

Ranjaga Pitham and Sadhaga Pitham was affected in100% of patients, Aalosaga Pitham was affected in 40% of patients and Prasaga Pitham was affected in 35% of patients.

Iyyam:

Sl. No	Iyyam	No. of Patients/40	Percentage
1.	Avalambagam	0	0%
2.	Kilethagam	0	0%
3.	Pothagam	0	0%
4.	Tharpagam	8	40%
5.	Sandhigam	5	25%

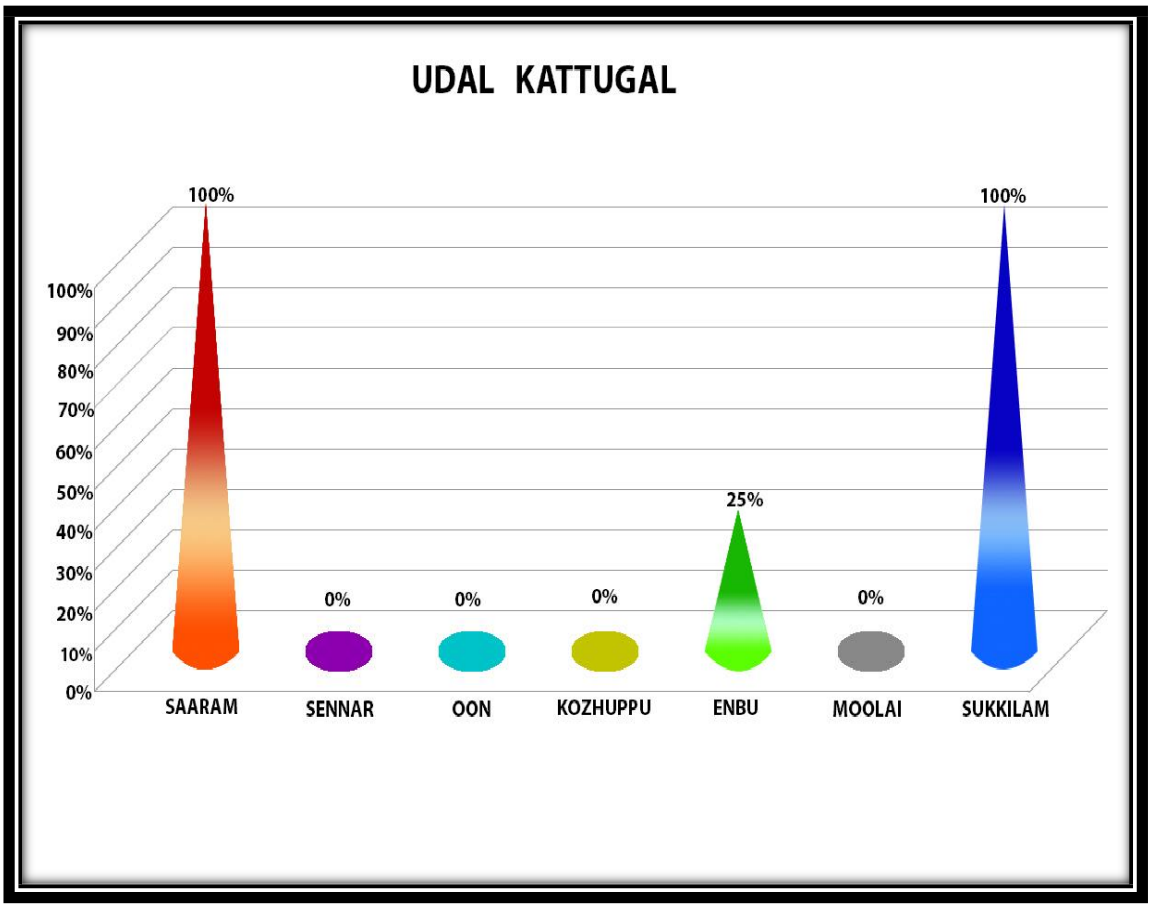


Inference:

Tharpagam was affected in 40% of patients and Sandhigam was affected in 25% of patients.

Udal Kattugal:

Sl. No	Udal Kattugal	No. of Patients/40	Percentage
1.	Saaram	20	100%
2.	Senner	0	0%
3.	Oon	0	0%
4.	Kozhuppu	0	0%
5.	Enbu	5	25%
6.	Moolai	0	0%
7.	Sukkilam	20	100%

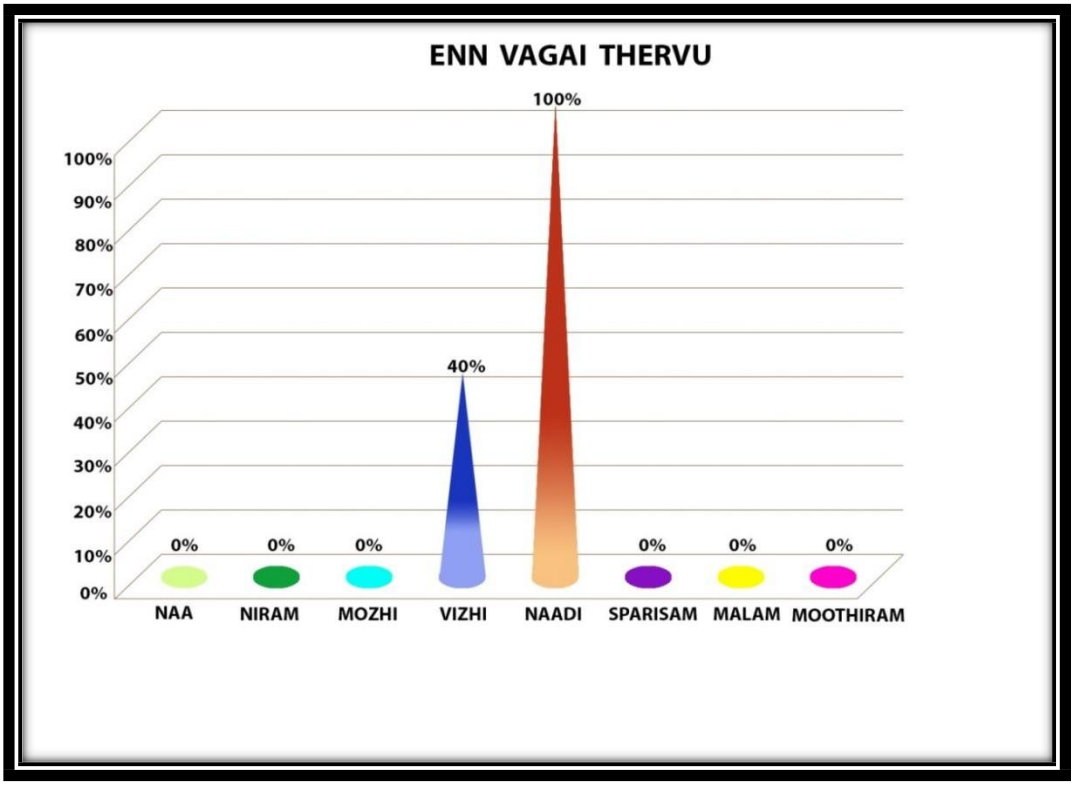


Inference:

Saaram and Sukkilam were affected in 100% of patients and Enbu was affected in 25% of patients.

Enn Vagai Thervu:

Sl. No	Enn Vagai Thervu	No. of Patients/40	Percentage
1.	Naa	0	0%
2.	Niram	0	0%
3.	Mozhi	0	0%
4.	Vizhi	8	40%
5.	Naadi	20	100%
6.	Sparisam	0	0%
7.	Malam	0	0%
8.	Moothiram	0	0%

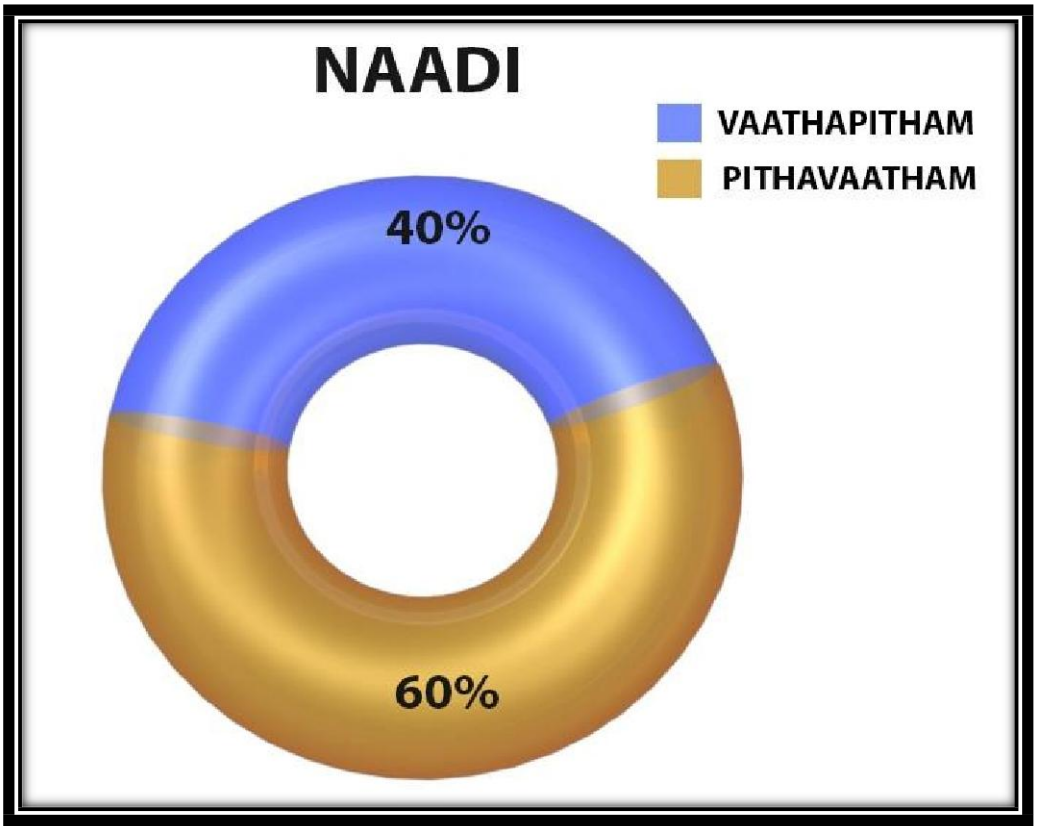


Inference:

Naadi was affected in 100% of patients and Vizhi was affected in 40% of patients.

Naadi:

Sl. No	Naadi	No. of Patients/40	Percentage
1.	Vaathapitham	24	60%
2.	Pithavaatham	16	40%

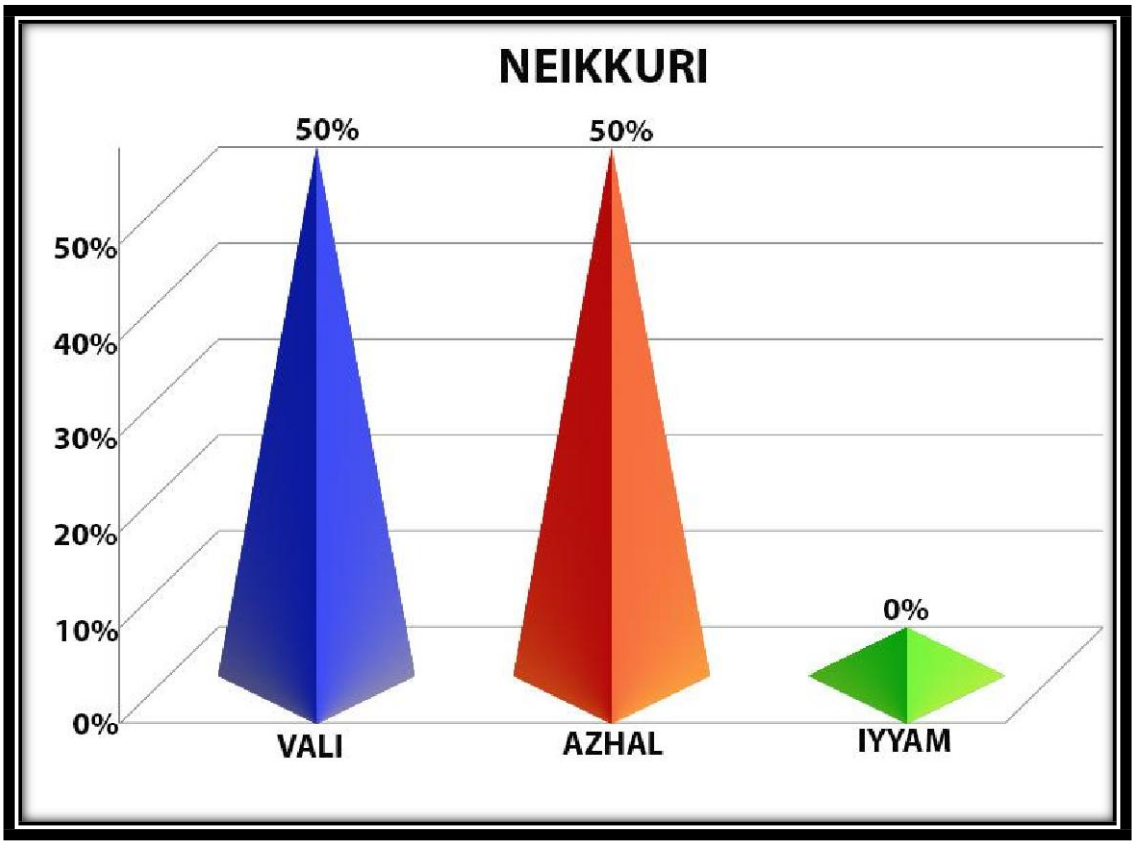


Inference:

60% of patient‟ s Vaathapitham Naadi was felt and 40% of patient‟ s Pithavaatham Naadi was felt.

Neikkuri:

Sl. No	Neikkuri	No. of Patients/40	Percentage
1.	Vali (spreads like snake)	20	50%
2.	Azhal (spreads like ring)	20	50%
3.	Iyyam (spreads like pearl)	0	0%

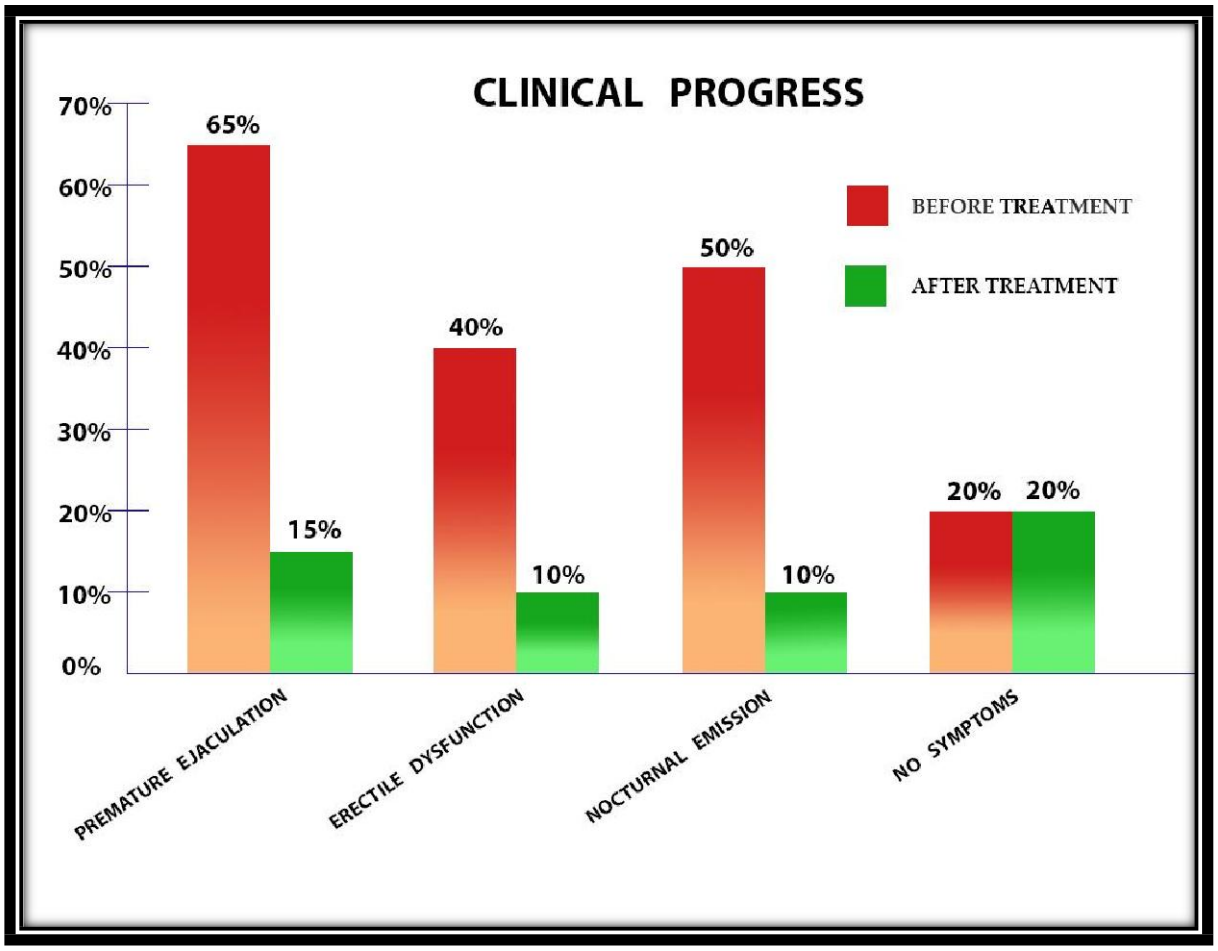


Inference:

50% of cases show Vali Neikkuri and 50% of cases show Azhal Neikkuri

Clinical Progress:

Sl. No	Symptoms	No. ofPatients/40		Percentage	
		BT	AT	BT	AT
1.	Premature Ejaculation	13	3	65%	15%
2.	Erectile Dysfunction	8	2	40%	10%
3.	Nocturnal Emission	10	2	50%	10%
4.	No Symptoms	4	4	20%	20%



Inference:

Before treatment 65% of cases had Premature Ejaculation, 40% of cases had Erectile Dysfunction and 50% of cases had Nocturnal Emission.

After treatment Premature Ejaculation having 15% of cases, Erectile Dysfunction and Nocturnal Emission of cases respectively having 10%

Semen Analysis before treatment and after treatment:

GROUP –I (MEDICINE ONLY)

Sl. No	SPERM COUNT Million/cu mm	No. of Patients/20		Percentage	
		BT	AT	BT	AT
1	1-10 million/cu mm	7	1	17.5%	2.5%
2	11-20 million/cu mm	11	5	27.5%	12.5%
3	21-30 million/cu mm	2	1	5%	2.5%
4	31-40 million/cu mm	Nil	3	Nil	7.5%
5	41-50 million/cu mm	Nil	4	Nil	10%
6	51-60 million/cu mm	Nil	4	Nil	10%
7	61-70 million/cu mm	Nil	2	10%	5%
8	71-80 million/cu mm	Nil	Nil	Nil	Nil

GROUP-II (MEDICINE WITH YOGAMTHERAPY)

Sl. No	SPERM COUNT Million/cu mm	No. of Patients/20		Percentage	
		BT	AT	BT	AT
1	1-10 million/cu mm	6	1	15%	2.5%
2	11-20 million/cu mm	11	1	27.5%	2.5%
3	21-30 million/cu mm	3	2	7.5%	5%
4	31-40 million/cu mm	Nil	1	Nil	2.5%
5	41-50 million/cu mm	Nil	3	Nil	7.5%
6	51-60 million/cu mm	Nil	5	Nil	12.5%
7	61-70 million/cu mm	Nil	4	Nil	10%
8	71-80 million/cu mm	Nil	1	Nil	2.5%
9	81-90 million/cu mm	Nil	1	Nil	2.5%
10	91-100 million/cu mm	Nil	Nil	Nil	Nil
11	101-110 million/cu mm	Nil	1	Nil	2.5%

Inference:

GROUP I MEDICINE ONLY

Before treatment

17.5% of cases sperm count had 1-10 million/cumm, 27.5% of cases sperm count had 11-20 million/cumm, 5% cases sperm count had 21-30 million/cumm, 10% of cases sperm count had 61-70 million/cumm (This 10% of cases Active Motility were below normal level)

After treatment

2.5% of cases sperm count had 1-10 million/cumm, 12.5% of cases sperm count had 11-20 million/cumm, 2.5% cases sperm count had 21-30 million/cumm, 7.5% of cases sperm count had 31-40 million/cumm, 10% of cases sperm count had 41-50 million/cumm, 10% of cases sperm count had 51-60 million/cumm, 5% of cases sperm count had 61-70 million/cumm,

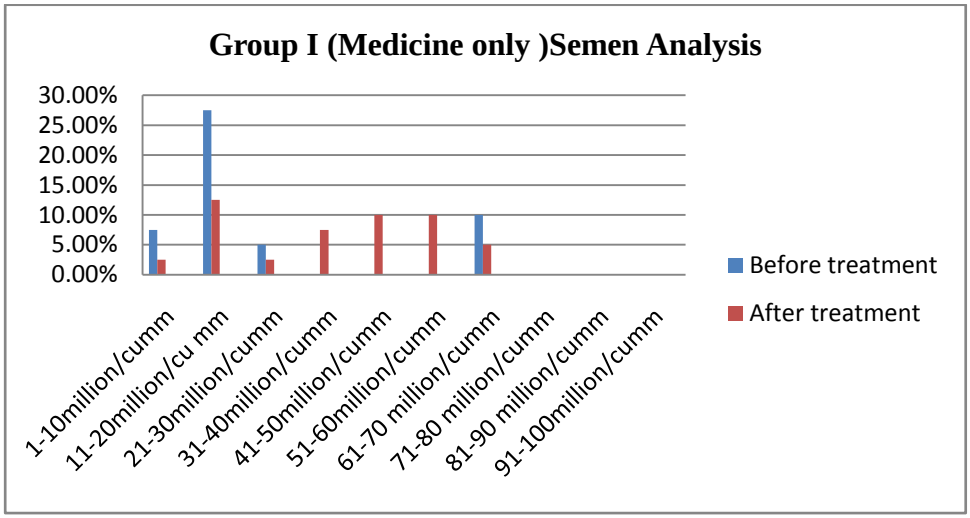
GROUP II MEDICINE WITH YOGAM THERAPY

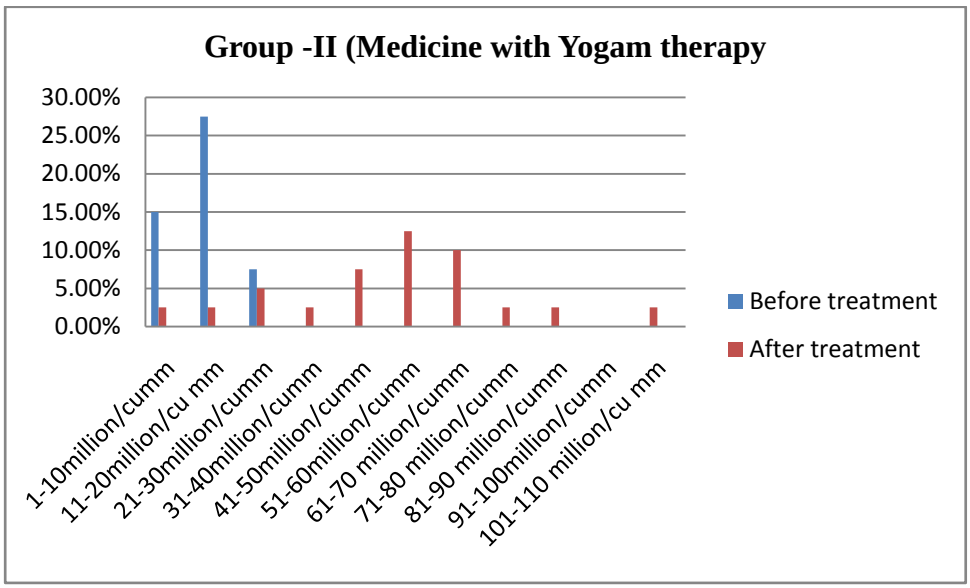
Before treatment

15% of cases sperm count had 1-10 million/cumm, 27.5% of cases sperm count had 11-20 million/cumm,7. 5% cases sperm count had 21-30 million/cumm,

After treatment

2.5% of cases sperm count had 1-10 million/cumm, 2.5% of cases sperm count had 11-20 million/cumm, 5% cases sperm count had 21-30 million/cumm, 2.5% of cases sperm count had 31-40 million/cumm, 7.5% of cases sperm count had 41-50 million/cumm, 12.5% of cases sperm count had 51-60 million/cumm, 10% of cases Sperm count had 61-70 million/cumm, 2.5% of cases sperm count had 71-80 million/cumm, 2.5% of cases sperm count had 81-90million/cumm, 2.5% of cases sperm count had 101-110 million/cumm.


Group I (Medicine only)Semen Analysis
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
1-10million/cumm
11-20million/cu mm
21-30million/cumm
31-40million/cumm
41-50million/cumm
51-60million/cumm
61-70 million/cumm
71-80 million/cumm
81-90 million/cumm
91-100million/cumm
Before treatment
After treatment


Group -II (Medicine with Yogam therapy
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
1-10million/cumm
11-20million/cu mm
21-30million/cumm
31-40million/cumm
41-50million/cumm
51-60million/cumm
61-70 million/cumm
71-80 million/cumm
81-90 million/cumm
91-100million/cumm
101-110 million/cu mm
Before treatment
After treatment

SEXUAL HEALTH SCORE

S.NO	OPD NO	SHC 13/13		SHC % (PERCENTAGE)		Results Score 13/13	
		BT	AT	BT	AT	BT	AT
1.	I75584	7	9	53	69	Excellent	Excellent
2.	J21944	9	10	69	76	Excellent	Excellent
3.	J73812	6	9	46	69	Excellent	Excellent
4.	J99050	5	8	38	61	Excellent	Excellent
5.	J44749	4	6	30	46	VeryGood	Excellent
6.	H88868	5	8	38	61	Excellent	Excellent
7.	J91432	8	7	61	53	Excellent	Excellent
8.	J89161	4	6	30	46	VeryGood	Excellent
9.	J35031	2	6	15	46	Moderate	Excellent
10.	J14466	8	9	61	69	Excellent	Excellent
11.	F99587	6	11	46	84	Excellent	Excellent
12.	J92651	10	11	76	84	Excellent	Excellent
13.	J51711	9	9	69	69	Excellent	Excellent
14.	K03734	5	7	38	69	Excellent	Excellent
15.	J95223	8	10	61	76	Excellent	Excellent
16.	H52513	7	9	53	69	Excellent	Excellent
17.	J87368	5	7	38	53	Excellent	Excellent
18.	J92653	4	6	30	46	VeryGood	Excellent
19.	J92647	7	9	53	69	Excellent	Excellent
20.	J45803	7	11	53	84	Excellent	Excellent

GROUP I MEDICINE

S.NO	OPD NO	SHC 13/13		SHC %		Results	
		BT	AT	BT	AT	BT	AT
1.	I95862	5	10	38	76	Excellent	Excellent
2.	K01853	7	12	53	92	Excellent	Excellent
3.	H71796	5	10	38	76	Excellent	Excellent
4.	I77003	8	12	61	92	Excellent	Excellent
5.	I81689	9	12	69	92	Excellent	Excellent
6.	H14287	4	7	38	76	Excellent	Excellent
7.	J32737	5	10	38	76	Excellent	Excellent
8.	K04023	7	12	53	92	Excellent	Excellent
9.	K06217	6	12	46	92	Excellent	Excellent
10.	J92655	8	11	61	84	Excellent	Excellent
11.	J33777	6	12	46	92	Excellent	Excellent
12.	J89599	5	10	38	76	Excellent	Excellent
13.	J41481	5	9	38	69	Excellent	Excellent
14.	K14518	3	9	23	69	Good	Excellent
15.	I69657	6	10	46	76	Excellent	Excellent
16.	J41481	6	12	46	92	Excellent	Excellent

GROUP II MEDICINE WITH YOGAMTHERAPY

17.	K01067	6	9	46	69	Excellent	Excellent
18.	J95313	8	12	30	46	Excellent	Excellent
19.	F03268	6	11	46	84	Excellent	Excellent
20.	K18433	8	12	61	92	Excellent	Excellent

SEMEN ANALYSIS			
S.No	Results	No.of .Patients 40	Perchantage
1	Good	23	57.5%
2	Moderate	9	22.5%
3	Poor	8	20%

SEXUAL HEALTH SCORE			
S.No	Results	No.of.Patients 40	Perchantage
1	Excellent	40	100%
2	Very Good	0	0
3	Good	0	0

DISCUSSION

DISCUSSION:

One of the Predominant disorders that endanger human species is **INFERTILITY** in Both men and women. The incidence of infertility is comparatively higher in males became of the drastic changes in human life style – irregular food habits, high calorie food items, fast foodbehavioral changes. Environmental toxins and changed compounds used for dispensing variousailments.

It has been suggested that the average sperm count has been decreasing over the past 50 years.

Aan maladu as stated in yugi vaidya chindhamani has close resemblance with male infertility in Allopathic Medicine.

In my study 40 patients were treated in outpatient department of Sirappu Maruthuvam department, Ayothidass Pandithar Hospital attached with National Institute of Siddha, Chennai – 47.

All patients were subjected to preliminary investigations which include hematological, urine examination, Semen Analysis,Sexual Health Score before and after Treatment.

Before Treatment purgative was given to all patients to balance the altered three dhosas (vaatha, pitha, kabha).

The Trial Medicine THETRAN ILAGAM was administered from the next day onward, course of the Treatment is 45 days.

Age Distribution:

According to this study age distribution was 37.5% of patients were in age group 21-30 years, 52.5% of patients were in age group 31-40 years and 10% of patients were in age group 41-50years.

Distribution of Thinai:

According to this study 65% of the Patients came from Neithal because Chennai and surrounding areas come under Neithal thinai, and 35% of patients were from Marutham.

Paruvakalam:

According to this study 40% of cases came in Koothir kaalam, 20% of cases in Kaar kaalam & Munpani kaalam, 15% of cases came in Elavenil kaalam and 5% cases in Mudhuvenil kaalam. Seasonal incidence is not affected their disease, maleinfertility.

Occupational Status:

40%of the patients were Drivers, 25% of patients were working as Labourers, 15% of patients are Businessman, and 20% of patients are Professionals.

Socio Economic Status:

The majority of the Patients affected are from poor socio economic status. Poor hygienic conditions expose to polluted atmosphere and lower immune response made them prone to the disease.

Food Habits:

20% Patients were pure vegetarian, 80% were Mixed Diet (including non-vegetarian). Though a non-vegetarian diet account is not a reason for the occurrence of male infertility.

Personal Habits:

In my study 15% of the Patients were using alcohol, 20%were smoker, 35% were having both smoker and alcohol and 30% of the patients were non intake of above this. The observation coincides with the conception that male infertility the disease may be due to smoking, Alcohol consumption.

Symptoms:

According to this study 65% of cases came with complaints of Premature Ejaculation, 40% of cases came with complaints of Erectile Dysfunction, and 50% of cases came with complaints of Nocturnal Emission 20% of cases had No Symptoms.

Classification of Results According To Vali, Azhal and Iyyam:-

Vali:

- Spermatogenesis, Premature Ejaculation, Nocturnal Emission is due to deranged AbanaVayu.

- Erectile dysfunction is due to derangedviyanan.
- In 100% patients abanan was affected, viyanan was affected 40% of patients.
- Koorman affected in 40% ofcases.
- And Devathathan affected in 70% ofcases

Azhal:

Ranjaga pitham and Sadhaga pitham were affected in 100% of cases. Aalosaga Pitham was affected in 40% of Patients. Prasaga Pitham was affected in 35% of patients.

Iyyam:

Tharpagam may be affected in Patients hot atmosphere. 40% of patients Tharpagam were affected. 25 % of Patients santhigam was affected & produce Joint Pain.

Udal Kattugal:

Both bodily and mental weakness arises when saaram was affected. In 100% of patients both the saaram and sukkilam were affected. In 25% of cases enbu was affected.

Envagai Thervu

Naadi was affected in 100% of patients and 40% of patients vizhi was affected.

Naadi

In 40% of patients Vaathapitha Naadi was felt and 60% of patients Pithavaatha Naadi were felt.

Neikuri

50% of cases show azhal neikuri (spreads like ring) and 50% of cases show vali neikuri (spreads like snake).

Clinical Progress:

Before treatment 65% of cases had Premature Ejaculation, 40% of cases had Erectile Dysfunction and 50% of cases had Nocturnal Emission.

After treatment Premature Ejaculation having 15% of cases, Erectile Dysfunction and Nocturnal Emission of cases respectively having

Semen Analysis:

Before treatment

25% of cases sperm count had 1-10 million/cumm, 50% of cases sperm count had 11-20 million/cumm, 15% cases sperm count had 21-30 million/cumm, 10% of cases sperm count had 61-70 million/cumm (This 10% of cases Active Motility were below normal level).

After treatment

5% of cases sperm count had 1-10 million/cumm, 10% of cases sperm count had 11-20 million/cumm, 5% cases sperm count had 21-30 million/cumm, 10% of cases sperm count had 31-40 million/cumm, 20% of cases sperm count had 41-50 million/cumm, 25% of cases sperm count had 51-60 million/cumm, 20% of cases sperm count had 61-70 million/cumm, 5% of cases sperm count had 71-80 million/cumm

Group I Patients

Among 20 cases 9cases were good improvement, 6 cases were moderate improvement, 5 cases Poor improvement.

Group II Patients

Among 20 cases 14 cases were good improvement, 3 cases were moderate improvement, 3 cases Poor improvement.

All the 40 patients among the 23 cases were good inmprovement, 9 cases were moderate improvement, 8 patients were poor improvement.

Trial Medicine:

All the 40 (20) patients treated with the Trial Medicine THETRAN ILAGAM with milk, 20 patients trial medicine along with Yogam therapy twice a day for 48 days. The disease and treatment are based primarily on the derangement of Mukkutram, which again is based on the Pancha bootham

theory. Incidence of Aan maladu and treatment are also based on these primary principles of Siddha medicine. The bootham raises azhal kuttram in the body and so as lead to general weakness and reduced sperm cell production. Increased azhal kuttram is brought to normal mainly by enippu suvai and thuvarpu suvai. These sweet and astringent tastes have the cool potency bynature.

A. Earth + Water =Sweet

B. Earth + Air =Astringent.

Thus they decrease the azhal kuttram. Sweet taste increases the spermatogenesis.

Toxicological Evaluation:

The drug also subjected to toxicological tests in rat models. The results revealed that the drug had very effective results. There were no signs of toxicity as could be judged by the absence of undesirable clinical manifestations.

Bio Statistical study:

The bio-statistical report of the clinical trial shows significant result.

SUMMARY

SUMMARY

The aim of the study is to increase the sperm count and sperm motility in male infertility patient. The trial medicine *Thetran Ilagam* was prepared as per literature. The duration of the trial period is 45 days. The trial doseis*Thetran Ilagam* 5gm.twiceadaywithcow‟ smilk.40 patients for the trial based on Inclusion and Exclusion criteria. Before treatment routine blood, urine and semen analysis taken in all 40 patients. This study has been approved by IEC of NIS [Date of IEC Approval & its number: NIS/IEC/2016/11-13/14.10.2016.. All 40 cases (20Group I & 20Group II) were treated in OPD of Ayothidoss Pandithar Hospital of National Institute of Siddha, Chennai-47. Patients were instructed to come for next review once in 7 days. 35 patients were come with clinical symptoms like premature ejaculation, erectile dysfunction, and nocturnal emission. The entire details of the patients were noted in the case sheet proforma.The detailed trial of Aan Maladu with reference to its aetiology, pathogenesis, investigations, clinical features, diagnosis and treatment with trial drugs was done. The results were observed by Semen Analysis and Sexual Health Score. All the 40 patients among the 23(57.5%) cases were good inmprovement, 9(22.5 %) cases were moderate improvement, and 8 (20%) patients were poor improvement.

CONCLUSION

CONCLUSION

- The polyherbal formulation *Thetran Ilagam* exhibited no toxicity on short form administration. The quantitative outcome of Semen Analysis and Sexual Health score shows there is significant improved between at the start and end of treatment i.e the mean and standard deviation is from 13.2±7.14 and 46.8 ± 23.2. The qualitative outcome shows encouraging results of All the 40 patients among the 23(57.5%) cases were good inmprovement, 9(22.5 %) cases were moderate improvement, and 8 (20%) patients were poor improvement.From the above results, the trail drugs "*Thetran Ilagam*" (Internal Medicine) is responded well for the treatment of Aan MaladuTherefore the author concluded that the yogam based intervention in the management of Aan maladu produced better outcome..

ANNEXURE I

CERTIFICATES

NATIONAL INSTITUTE OF SIDDHA- राष्ट्रीय सिद्ध संसथान
Ministry of AYUSH- आयुष मंत्रालय
GOVERNMENT OF INDIA-भारत सरकार
TAMBARAM SANATORIUM, CHENNAI -600 047 -ताम्बरम सनटोरियमचेन्नई -600 047
फ़ोन\Tele : 044-22411611 फैक्स\Fax : 22381314
ईमेल: nischennaisiddha@yahoo.co.in वेब :www.nischennai.org

F.No.NIS/6-20/IEC/15-16 Dt: 14.10.2016

CERTIFICATE

Address of Ethics Committee: National Institute of Siddha, Tambaram Sanatorium, Chennai-600047, Tamil Nadu, India	
Principal Investigator: Dr. S.Karthik Nagarajan–I year, Dept.of Sirappu Maruthuvam	
Protocol Title:- Preclinical and comparative Clinical Trial of "Thetran Ilagam (Internal) and Yogam therapy in the management of "Aan Maladu (Male infertility)"	
Documents filed	1) Protocol, 2) Data Collection forms
Clinical trial Protocol (others – Specify)	**Yes-(M.D-Dissertation)**
Informed consent documents	**Yes**
Any other documents	**-**
Date of IEC approval & its number	**NIS/IEC/2016/11-13/ 14.10.2016**

We approve the trial to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study, any SAE occurring in the course of the study.

(Dr.V.Subramanian)
Chairman

(Prof.Dr.V.Banumathi)
Member Secretary

NATIONAL INSTITUTE OF SIDDHA CHENNAI 600 047

CERTIFICATE

This is certify that the project title Preclinical and Comparative clinical trial of ***Thetran Ilagam***(Internal medicine) and Yogam therapy for the treatment of **Aanmaladu**(Male infertility)**has been approved by the IAEC.** Approval No: NIS/IAEC-III/09/29092016
Total No. of animals approved: 89 Rats (40M+49F)

Prof.Dr.V.Banumathi
Name of Chairman/Member Secretary IAEC:

Prof.Dr.K. Nachimuthu
Name of CPCSEA nominee:

Signature with date
V. Banumathi 29/11/16
Chairman/Member Secretary of IAEC:

CPCSEA nominee: 29/11/2016

(Kindly make sure that minutes of the meeting duly signed by all the participants are maintained by Office)

Name of the PI: Dr.S.Karthik Nagarajan

Name of the Department: Sirappu Maruthuvam

NATIONAL INSTITUTE OF SIDDHA, CHENNAI – 600047

BOTANICAL CERTIFICATE

Certified that the following plant drugs used in the Siddha formulation **"Thetran Ilagam"** (Internal) taken up for Post Graduation Dissertation studies by **Dr.S.Karthik Nagarajan** M.D.(S), II year, Department of Sirappu Maruthuvam, 2017, are identified through Visual inspection, Experience, Education & Training, Organoleptic characters, Morphology and Taxonomical methods as

Strychnos potatorum Linn. (Loganiaceae), Seed
Cuminum cyminum Linn. (Apiaceae), Fruit
Papaver somniferum Linn. (Papaveraceae), Seed
Cinnamomum verum Presl. (Lauraceae), Bark
Piper cubeba Linn. f. (Piperaceae), Fruit
Ocimum basilicum Linn. (Lamiaceae), Seed
Myristica fragrans Houtt. (Myristicaceae), Nut
Myristica fragrans Houtt. (Myristicaceae), Aril
Piper nigrum Linn. (Piperaceae), Fruit
Plantago ovata Forssk. (Plantaginaceae), Seed
Pistacia lentiscus Linn. (Anacardiaceae), Resin
Punica granatum Linn. (Punicaceae), Seed
Hygrophila auriculata Heine (Acanthaceae), Seed
Asparagus racemosus Willd. (Liliaceae), Root
Curculigo orchioides Gaertn. (Amaryllidaceae), Rhizome
Trachyspermum ammi (Linn.) Sprague (Apiaceae), Fruit
Vitis vinifera Linn. (Vitaceae), Dried fruit
Phoenix dactilifera Linn. (Arecaceae), Dried fruit
Buchanania lanzan Spreng. (Anacardiaceae), Seed
Prunus dulcis (Mill.) D.A. Webb (Rosaceae), Seed

CHENNAI 600 047 National Institute of Siddha

Certificate No: NISMB2932017

Date: 07-04-17

Authorised Signatory
Dr. D. ARAVIND, M.D.(s),M.Sc.,
Assistant Professor
Department of Medicinal Botany
National Institute of Siddha
Chennai - 600 047. INDIA

1/4

The Tamil Nadu Dr.M.G.R.Medical University

69, Anna Salai, Guindy, Chennai - 600 032.

*This Certificate is awarded to Dr/Mr/Mrs....*KARTHIK..NAGARAJAN.:S.....

For participating as ~~Resource Person~~ / Delegate in the Twenty First Workshop on

"RESEARCH METHODOLOGY & BIOSTATISTICS"

*For **AYUSH Post Graduates & Researchers***

Organized by the Department of Siddha

The Tamil Nadu Dr. M.G.R. Medical University From 25th to 29th April 2016.

Dr.N.KABILAN, MD(S),
PROF & HEAD
DEPT.OF SIDDHA

Prof.**Dr.P.ARUMUGAM,** M.D.,
REGISTRAR i/c

Prof. **Dr.S.GEETHALAKSHMI,** M.D., Ph.D.
VICE CHANCELLOR

NATIONAL INSTITUTE OF SIDDHA

(An Autonomous body under Ministry of AYUSH, Govt. of India)
Tambaram Sanatorium, Chennai- 600 047

Workshop on

"BASIC RESEARCH TECHNIQUES AND PRACTICES INVOLVED IN LABORATORY ANIMAL CARE"

06 -10 February 2017

CERTIFICATE

This is to certify that Dr.....S.Karthik Nagarajan..... has participated as Delegate/Resource Person in the workshop on "Basic Research Techniques and Practices involved in Laboratory Animal Care" held on 06-10 February, 2017 at National Institute of Siddha, Chennai-47, Tamilnadu.

Dr. V. Suba
Organizing Secretary

Dr. P. Muthusamy
Veterinary Consultant

Prof. Dr. V. Banumathi
Director / Chairperson

ANNEXUREII

BIOCHEMICAL ANALYSIS

ANNEXURE -II

BIO-CHEMICAL ANALYSIS

BIO-CHEMICAL ANALYSIS OF TRIAL MEDICINES

Preparation of Sodium Carbonate extract:

2 gm of the sample drug is mixed 5 gm of Sodium carbonate and taken in a 100 ml beaker and 20 ml of distilled water is added. The solution is boiled for 10 minutes, cooled and then filtered. The filtrate is called sodium carbonate extract.

S.No	EXPERIMENT	OBSERVATION	INFERENCE
I	**TEST FOR ACID RADICALS**		
1a	**Test for Sulphate** 2 ml of the above prepared extract is taken in a test tube. To this add 2ml of 4% Ammonium oxalate solution.	Absence of WhitePrecipitate	Absent
b	2ml of extract is added with 2ml of dilute hydrochloric acid until the effervescence ceases off. Then 2ml barium chloride solution is added.	Absence of WhitePrecipitate	Absent
2	**Test for Chloride:** 2ml of extract is added with dilute nitric acid till the effervescence ceases. Then 2ml of silver nitrate solution is added.	Absence of white precipitate Obtained	Absent
3	**Test for Phosphate** 2ml of the extract is treated with 2 ml of Ammonium molybdate solution and 2ml of concentrated nitric acid.	Yellow precipitate Obtained	Present

4	**Test for Carbonate:** 2ml of the extract is treated with 2ml of magnesium sulphate solution.	Absence of white Precipitate	Absent
5	**Test for Sulphide:** 1 gm of the substance is treated with 2ml of concentrated Hydrochloric acid	Rotten egg smelling	Present
6	**Test for Nitrate:** 1gm of the substance is heated with copper turnings and concentrated sulphuric acid and viewed the test tube vertically down.	Absence of reddish brown gas.	Absent
7a	**Test for Fluoride and oxalate** 2ml of the extract is added with 2ml of dilute acetic acid and 2ml of calcium chloride solution and heated.	White precipitate	Present
b	5 drops of clear solution is added with 2ml of dilute sulphuric acid and slightly warmed to this, 1 ml of dilute potassium permanganate solution is added.	KMNO4 solution Discolourisation obtained	Present
8	**Test for Nitrite** 3 drops of the extract is placed on a filter paper. On that, 2 drops a Acetic Acid and 2 drops of Benzidine solution is placed.	Absence of yellowish red colour	Absent

9	**Test for Borate** 2 pinches of the substance is made into paste by using Sulphuric acid and Alcohol (95%) and introduced into the blue flame.	Absence of Green tinged flame	Absent
II	**TEST FOR BASIC RADICALS**		
10	**Test for lead** 2 ml of the extract is added with 2 ml of Potassium iodide solution.	Absence of Yellow Precipitate	Absent
11a	**Test for Copper** One pinch of substance is made into paste with concentrated Hydrochloricacid in a watch glass and introduced into the non luminous partof the flame.	Absence of Bluish green coloured flame.	Absent
b	2ml of the extract is added with excess of Ammonia solution	Absence of deep Blue	Absent
12	**Test for Aluminium** To the 2 ml of extract. Sodium Hydroxide solution is added in drops to excess	Absence of White Precipitate.	Absent
13a	**Test for Iron** To the 2 ml of extract, 2 ml of Ammonium Thiocyanate Solution is added.	Blood red colour	Present
b	To the 2 ml of extract, 2 ml of Ammonium Thiocyanate solution and 2 ml of concentrated Nitric Acid is added.	Blood red colour obtained	Present

14	**Test for Zinc** To the 2 ml of extract Sodium Hydroxide solution is added in drops to excess.	Absence of White precipitate.	Absent
15	**Test for Calcium** 2 ml of the extract is added with 2 ml of 4% Ammonium Oxalate solution.	Absence of White precipitate.	Absent
16	**Test for Magnesium** 2ml of extract, Sodium Hydroxide solution is added in drops to excess.	Absence of White precipitate.	Absent
17	**Test for Ammonium** 2 ml of extract few ml of Nessler‟ s Reagent and excess of Sodium Hydroxide solution are added.	Absence of Reddish brown Precipitate	Absent
18	**Test for Potassium** A pinch of substance is treated with 2 ml of Sodium Nitrite solution and then treated with 2 ml of Cobal Nitrate in 30% glacial Acetic acid.	Absence of Yellow precipitate	Absent
19	**Test for Sodium** 2 pinches of the substance is made into paste by using Hydrochloric acid and introduced into the blue flame	Absence of Yellow colour flame	Absent
20	**Test for Mercury** 2 ml of the extract is treated with 2 ml of Sodium Hydroxide solution.	Absence of yellow Precipitate	Absent

21	**Test for Arsenic** 2 ml of extract is treated with 2 ml of silver Nitrate solution	Absence of Yellow precipitate	Absent
22	**Test for Starch** 2ml of extract is treated with weak iodine solution	Absence of Blue colour	Absent
23	**Test of reducing Sugar** 5ml of Benedicts qualitative solution is taken in a test tube and allowed to boil for 2 minutes and added 10 drops of the extract and again boiled for 2 minutes. The colour changes are noted.	Green colour	Present
24	**Test of the alkaloids** 2ml of the extract is treated with 2ml of potassium lodide solution.	Absence of Red colour	Absent
25	**Test of the proteins** 2ml of the extract is treated with 2ml of 5% NaOH ,mix well and add 2 drops of copper sulphate solution.	Absence of Violet colour	Absent

RESULTS:

The given sample (THETRAN ILAGAM) contains

- Phosphate,
- Sulphide,
- Fluoride and Oxalate,
- Iron,
- Reducingsugar.

ANNEXURE III

PHYSICOCHEMICALANALYSIS

ANNEXURE –III

Project ID	**NRS/AS/0102/03/2018**
Source	**Dr.Karthik Nagarajan** **National Institute of Siddha ,** **Tambaram Sanatoruim,** **Chennai 600047,Tamilnadu, India**
Purpose	**Physicochemical Analysis**
Sample –ID	**TI**

Sample Description

State	Semi solid
Appearance	Dark Brown
Nature	Greasy touch
Odor	Strong Characteristic odour

S.No	Parameter	Mean (n=3) SD
1.	***Loss on Drying at 105 °C (%)***	31.57 ± 3.15
2.	***Total Ash (%)***	14.56 ± 0.66
3.	***Acid insoluble Ash (%)***	16.07 ± 1.60
4.	***Water Soluble Ash (%)***	12.93 ± 0.80
5.	***Alcohol Soluble Extractive (%)***	11.61 ± 0.75
6.	***Water soluble Extractive (%)***	9.03 ± 1.12
7.	***pH***	5

Project ID	**NRS/AS/0102/03/2018**
Name and Address of the Researcher	**Dr.Karthik Nagarajan** **National Institute of Siddha, Chennai** **Tamilnadu, India**
Parameter Requested by the Customer for Analysis	**Phytochemical Analysis**
Sample Received	**Post**
Sample –ID	**Thetran Ilagam** **TI**

Extraction

Sample Extraction were carried out with n-hexane , chloroform and the resulting extract was utilized for the phytochemical analysis

PHYTOCHEMICAL ANALYSIS

Test for alkaloids:

Mayer's Test: To the test sample, 2ml of mayer's reagent was added, a dull white precipitate revealed the presence of alkaloids.

Test for coumarins:

To the test sample, 1 ml of 10% sodium hydroxide was added. The presence of coumarins is indicated by the formation of yellow color.

Test for saponins:

To the test sample, 5 ml of water was added and the tube was shaken vigorously. Copious lather formation indicates the presence of Saponins.

Test for tannins:

To the test sample, ferric chloride was added, formation of a dark blue or greenish black color showed the presence of tannins.

Test for glycosides- Borntrager's Test

Test drug is hydrolysed with concentrated hydrochloric acid for 2 hours on a water bath, filtered and the hydrolysate is subjected to the following tests. To 2 ml of filtered hydrolysate, 3 ml of choloroform is added and shaken, choloroform layer is separated and 10% ammomia solution is added to it. Pink colour indicates presence of glycosides.

Test for flavonoids:

To the test sample about 5 ml of dilute ammonia solution were been added followed by addition of few drops of conc. Sulfuric acid. Appearance of yellow color indicates the presence of Flavonoids.

Test for phenols:

Lead acetate test: To the test sample; 3 ml of 10% lead acetate solution was added. A bulky white precipitate indicated the presence of phenolic compounds.

Test for steroids:

To the test sample , 2ml of chloroform was added with few drops of conc. Sulphuric acid (3ml), and shaken well. The upper layer in the test tube was turns into red and sulphuric acid layer showed yellow with green fluorescence. It showed the presence of steroids.

Triterpenoids

Liebermann–Burchard test: To the chloroform solution, few drops of acetic anhydride was added then mixed well. 1 ml concentrated sulphuric acid was added from the sides of the test tube, appearance of red ring indicates the presence of triterpenoids.

Test for Cyanins

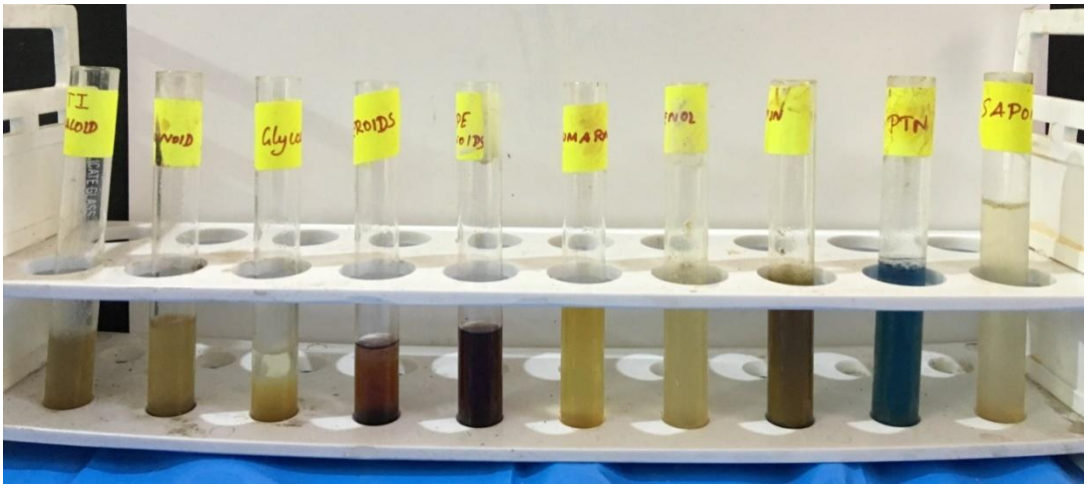
A. Aanthocyanin:

To the test sample, 1 ml of 2N sodium hydroxide was added and heated for 5 min at 100□C. Formation of bluish green colour indicates the presence of anthocyanin.

Test for Carbohydrates - Benedict's test

To the test sample about 0.5 ml of Benedic's reagent is added. The mixture is heated on a boiling water bath for 2 minutes. A characteristic coloured precipitate indicates the presence of sugar.

RESULTS



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E-mail: nobleresearchsolutions@gmail.com
Contact: 9710437419, Admin: 044 - 42691289

Project ID	NRS/AS/0102/03/2018
Name and Address of the Researcher	Dr.Karthik Nagarajan National Institute of Siddha, Chennai Tamil Nadu, India
Parameter Requested by the Customer for Analysis	HPTLC Analysis
Sample Received	Post
Sample –ID	TI
Description of the Sample	Semi solid
Method of Analysis Instrument TLC Plate Mobile Phase Extraction Solvent	 CAMAG TLC SCANNER III Aluminium Coated Silica Gel – Merck Toulene: Ethyl Acetate: Acetic Acid (1.5:1:0.5) Acetone
Analysis Type	Third Party Analysis
Date of Analysis	19/03/2018
Result of Analysis	Test Report Attached

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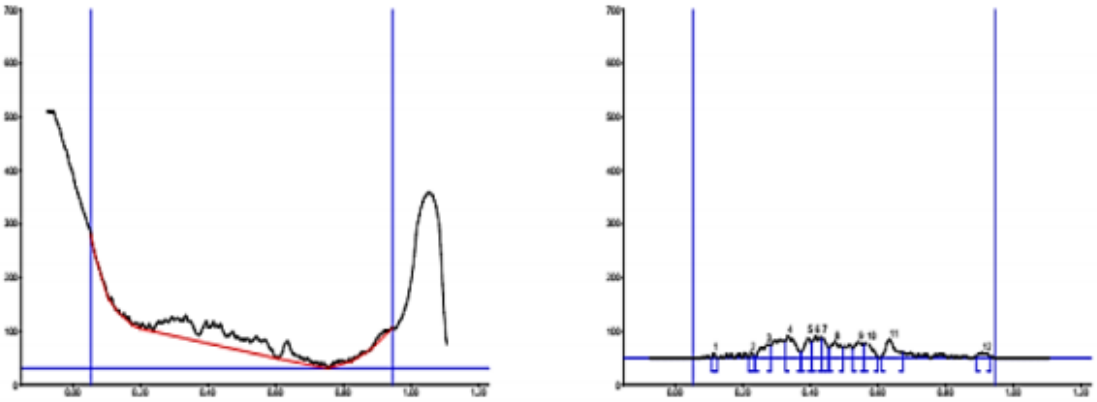
E-mail: nobleresearchsolutions@gmail.com
Contact: 9710437419, Admin: 044 - 42691289

HPTLC finger printing of Sample TI



Peak Table

Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %
1	0.11	0.9	0.11	10.5	2.98	0.12	0.2	57.8	0.95
2	0.22	0.3	0.22	12.2	3.43	0.24	4.3	82.4	1.36
3	0.24	4.4	0.27	26.1	7.36	0.28	24.2	577.0	9.51
4	0.33	31.1	0.33	42.8	12.07	0.37	12.5	870.8	14.35
5	0.37	12.3	0.39	40.4	11.39	0.40	29.6	570.8	9.41
6	0.40	30.4	0.42	42.4	11.96	0.43	35.0	691.7	11.40
7	0.43	37.0	0.44	41.0	11.56	0.45	19.8	428.6	7.06
8	0.46	20.2	0.47	31.7	8.96	0.50	20.3	691.9	11.40
9	0.52	19.6	0.54	31.9	9.00	0.56	25.1	602.7	9.93
10	0.56	25.5	0.57	29.2	8.25	0.60	3.0	506.3	8.34
11	0.61	3.7	0.64	35.4	9.98	0.67	10.5	763.6	12.58
12	0.89	3.6	0.91	10.8	3.05	0.93	3.3	225.2	3.71

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E-mail: nobleresearchsolutions@gmail.com
Contact: 9710437419, Admin: 044 - 42691289

REPORT

HPTLC finger printing analysis of the sample TI reveals the presence of twelve prominent peaks corresponds to presence of twelve versatile phytocomponents present with in it. Rf value of the peaks ranges from 0.11 to 0.89. Further the peak 4 occupies the major percentage of area of 14.35 % which denotes the abundant existence of such compound. Followed by this peak 11, 6 and 8 occupies the percentage area of 12.58 % and 11.40 % respectively.

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E-mail: nobleresearchsolutions@gmail.com
Contact: 9710437419, Admin: 044 - 42691289

Project ID	NRS/AS/0102/03/2018
Name and Address of the Researcher	Dr. S.Karthik Nagarajan National Institute of Siddha, Chennai Tamil Nadu, India
Parameter Requested by the Customer for Analysis	Heavy Metal analysis by AAS
Sample Received	Post
Sample –ID	Thetran Ilagam- TI
Description of the Sample	Semil Solid
Method of Analysis Instrument Extraction Solvent	 Model: AA 240 Series HCl and HNO_3
Analysis Type	Third Party Analysis
Date of Analysis	22/03/2018
Result of Analysis	Test Report Attached

E-mail: nobleresearchsolutions@gmail.com
Contact: 9710437419, Admin: 044 - 42691289

HEAVY METAL ANALYSIS BY AAS

Standard: Hg, As, Pb and Cd – Sigma

Methodology

Atomic Absorption Spectrometry (AAS) is a very common and reliable technique for detecting metals and metalloids in environmental samples. The total heavy metal content of the sample TI was performed by Atomic Absorption Spectrometry (AAS) Model AA 240 Series. In order to determination the heavy metals such as mercury, arsenic, lead and cadmium concentrations in the test sample TI

Sample Digestion

Test sample TI digested with 1mol/L HCl for determination of arsenic and mercury. Similarly for the determination of lead and cadmium the sample were digested with 1mol/L of HNO3.

Standard reparation

As & Hg- 100 ppm sample in 1mol/L HCl
Cd & Pb- 100 ppm sample in 1mol/L HNO_3

Test Report of the Sample TI

Name of the Heavy Metal	Absorption Max λ max	Result Analysis	Maximum Limit
Mercury	253.7 nm	BDL	1 ppm
Lead	217.0 nm	0.050 ppm	10 ppm
Arsenic	193.7 nm	BDL	3 ppm
Cadmium	228.8 nm	0.002 ppm	0.3 ppm

BDL- Below Detection Limit

Report and Inference

- Results of the present investigation has clearly shows that the sample TI has no traces of heavy metals such as mercury and Arsenic. Further the resultsshows the presence of Lead and cadmium at 0.050 and 0.002 ppm level.
- The reported heavy metals such as lead and cadmium seems very low when compare to the allowed recommended limit.

ANNEXURE IV

TOXICOLOGICAL STUDY

ANNEXURE -IV

Evaluation of the siddha drug *Thetran Ilagam*for its toxicological in Wistar Albino rats

ACUTE ORAL TOXICITY-EXPERIMENT PROCEDURE:

Acutetoxicitystudieswerecarriedoutaccordingtothe OECD(Organizationof Economic Co-operation and Development) guidelines 423. Healthy female rats, weighing 150–200g,wereselectedandoraladministrationofthesingledosesof*Thetran Ilagam* weredoneaseptically bysuspendingin1%SCMC(Sodiumcarboxymethylcellulose).

Administration of doses:

Thetran Ilagam in1%SCMCwasadministeredasasingleoraldosebygavageusinga feedingneedle.Animalswerefastedpriortodosing.Followingtheperiodoffasting,the animalswereweighedandthenthetestsubstancewasadministered.Afterthesubstance has been administered, food was withheld for a further 3-4 hours. The principle of laboratoryanimalcarewasfollowed.Observationsweremadeandrecordedsystematically andcontinuouslyobservedaspertheguidelineaftersubstanceadministration.Anoral(p.o) doseof5mg/kg,50mg/kg,300mg/kgand2000mg/kgwasadministeredstepbystep accordingtotheguidelines.Thegeneralbehaviorsoftheratswerecontinuouslymonitored for1hafterdosing,periodicallyduringthefirst24h(withspecialattentiongivenduringthe first 4 hours and then daily thereafter, for a total of 14 days. Changes in the normal psychomotor activity and external morphology and their body weights weremonitored periodicallybeforedosingandthetimeatwhichsignsoftoxicityormortalitywererecorded.

Thevisualobservationsincludedskinchanges,mobility,aggressively,sensitivityto soundandpain,aswellasrespiratorymovements.Theyweredeprivedoffood,butnot water12hpriortotheadministrationofthetestsubstance.Finally,thenumberofsurvivors wasnotedafter24handtheseanimalswerethenmaintainedforafurther14daysand observationsmadedaily.Thetoxicologicaleffectwasassessedonthebasisofmortality.

Number of animals and dose levels:

Three animals are used for each step. The dose level used as the starting dose

Groups	No. of Rat
Group I: Vehicle control	3 Female
Group V: test drug – 2000 mg/kg b.wt	6Female

TOTAL NO= 9(F)

OBSERVATIONS:

Animals were observed individually after dosing at least once during the first 30 minutes, periodically during the first 24 hours, with special attention given during the first 4 hours, and daily thereafter, for a total of 14 days, except where they need to be removed from the study and humanely killed for animal welfare reasons or are found dead. It should be determined by the toxic reactions, time of onset and length of recovery period, and may thus be extended when considered necessary. The times at which signs of toxicity appear and disappear are important, especially if there is a tendency for toxic signs to be delayed. All observations are systematically recorded with individual records being maintained for each animal. Observations include changes in skin and fur, eyes and mucous membranes, and also respiratory, circulatory, autonomic and central nervous systems, and somato motor activity and behavior pattern. Attention was directed to observations of tremors, convulsions, salivation, diarrhea, lethargy, sleep and coma. The principles and criteria summarized in the Humane Endpoints Guidance Document taken into consideration. Animals found in a moribund condition and animals showing severe pain or enduring signs of severe distress was humanely killed. When animals are killed for humane reasons or found dead, the time of death should was recorded.

4 hours observation in acute toxicity studies

Parameters observed	**Isthr**	**IIndhr**	**IIIrdhr**	**IVthhr**
Aggressiveness	+	+	+	+
Alertness	-	-	-	-
Alopecia	-	-	-	-
Circling	-	-	-	-
Diarrhoea	-	-	-	-
Edema	-	-	-	-
Eye closure at touch	+	+	+	+
Grip strength	+	+	+	+
Grooming	+	+	+	+
Lacrimation	-	-	-	-
Loss of writhing reflex	-	-	-	-
Mortality	-	-	-	-
Nasal sniffing	-	-	-	-
Piloerection	-	-	-	-
Rearing	-	-	-	-
Righting reflex	-	-	-	-
Seizures	-	-	-	-
Straub tail	-	-	-	-
Urine stains	-	-	-	-

14 days observation in acute toxicity studies

Evaluation of the siddha drug *Thuthuvalai legiyam* for its toxicological and Spermatogenic activity in Wistar Albino rats

Parameters observed	Day-1	Day-2	Day-3	Day-4	Day-5	Day-6	Day-7	Day-8	Day-9	Day-10	Day-11	Day-12	Day-13	Day-14
Aggressiveness	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Alertness	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alopecia	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Circling	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diarrhoea	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Edema	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eye closure at touch	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Grip strength	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Grooming	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Lacrimation	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Loss of writhing reflex	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mortality	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nasal sniffing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Piloerection	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rearing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Righting reflex	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Seizures	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Straub tail	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Urine stains	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Repeated dose 90-days sub-chronic oral toxicity study of *Thetran Ilagam* on rats

(OECD – 408 guidelines)

Test Substance	:	***Thetran Ilagam (TI)***
Animal Source	:	Tamil Nadu Veterinary and Animal Sciences University
Animals	:	Male and Female Wistar Albino Rats
Age	:	More than 6 weeks
Acclimatization	:	Seven days prior to dosing.
Veterinary examination	:	Priortoandattheendoftheacclimatizationperiod.
Identification of animals	:	Bycagenumber,animalnumberandindividual marking onfur.
Diet	:	Pelleted feed supplied by Saimeera foods Pvt Ltd, Bangalore
Water	:	Aqua guard portable water in polypropylene bottles *ad libitum.*
Housing &Environment	:	The animals were housed in Polypropylene cages provided with bedding of husk.
Housing temperature	:	Between 20 & 24°C,
Relative humidity	:	Between 30% and 70%,
Dark and light cycle	:	Each of 12 hours.

Justification for Dose Selection:

Theresultsofacutetoxicitystudiesinratsindicatedthat***Thetran Ilagam*** Wasnontoxicandnobehavioralchangeswereobserveduptothe doselevelof2000mg/kgbodyweight.Intheliterature,therapeutic dosage for ***Thetran Ilagam*** in humanis mentionedose is10000mg.

Theoralroutewas
Selectedforusebecauseoralrouteis consideredtobeaproposdtherapeutic route.

Preparation and administration of dose:

Thetran Ilagam *at*threedosesrespectivelywassuspendedinof 1%SCMCindistilledwater.Itwasadministeredtoanimalsatthedoselevels of100and200mg/kg.Thetestsubstancesuspensionswerefreshlyprepared everydayfor90days. Thecontrolanimalswereadministeredvehicleonly. Administrationwasbyoral(gavage),oncedailyfor90 daysconsecutivedays.

METHODOLOGY

Randomization, Numbering and Grouping of Animals:

TenRats(FiveMaleandFiveFemale)ineachgrouprandomlydivided intothreegroupsfordosingupto90days.Animal'sacclimatizationperiodof 7 days to laboratory conditions prior to the initiation of treatment. Each animalwasfurmarkedwithpicricacid.Thefemaleswerenulliporousand non-pregnant.

Groups	No. of Rats
Group I: control Vehicle	20(10M+ 10F)
GroupII: test drug (Thetran Ilagam)- Low dose (900mg/kgb.wt)	20(10M + 10F)
GroupIII: test drug(Thetran Ilagam) - Mid dose (1800mg/kgb.wt)	20(10M + 10F)
GroupIV: test drug(Thetran Ilagam) High dose (3600mg/kgb.wt)	20(10M + 10F)

Total 80 (40 Female + 40 Male)

OBSERVATIONS:

Experimental animals were kept under observation throughout the course of study for the following:

Body Weight:

Weight of each ratwas recorded on day 0 and at 5 days intervals throughoutthecourseofstudyandatterminationtocalculaterelativeorgan weights.Fromthedata, groupmeanbodyweightsandpercentbodyweightgain werecalculated.

Clinical signs:

Allanimalswereobserveddailyforclinicalsigns.Thetimeofonset, intensityanddurationofthesesymptoms,ifany,wererecorded.

Mortality:

Allanimalswereobservedtwicedailyformortalityduringentirecourse ofstudy.

TERMINAL STUDIES:

***Laboratory Investigations*:**

Following laboratory investigations were carried out on day 91 in animals' fasted over-night. On 91th day, the animals were fasted for approximately18h,thenslightlyanesthetizedwithetherandbloodsamples werecollectedfromtheretro-orbitalplexusintotwotubes:onewithEDTAfor immediate analysis of haematological parameters, the other without any anticoagulant and was centrifuged at 4000 rpm at 4 °C for 10 minutes to obtaintheserum.Serumwasstoredat20°Cuntilanalyzedforbiochemical parameters.

***Haematological Investigations*:**

Blood samples of control and experimental rats was analyzed for hemoglobincontent,totalredbloodcorpuscles(RBC),whitebloodcorpuscles (WBC)count,Meancorpuscularvolume(MCV)andpackedcellvolume(PCV). FromtheestimatedvaluesofRBCcount(millions/mm3)andPCV(volumes percent),meancorpuscularvolume(MCV)wascalculated.

***Biochemical Investigations*:**

Serum and Urine was used for the estimation ofbiochemical parameters.Samplesofcontrolandexperimentalmicewereanalyzedfor

protein, bilirubin, urea, uric acid, creatinine, triglyceride, cholesterol and glucoselevelswascarriedusingstandardmethods.Activitiesofglutamate oxaloacetate transaminase/ Aspartate aminotransferase (GOT/AST), glutamatepyruvatetransaminase/Alanineaminotransferase(GPT/ALT)and alkalinephosphatasewereestimatedasperthecolorimetricprocedure.

Necropsy:

Alltheanimalsweresacrificedonday91.Necropsyofallanimalswas carriedoutandtheweightsoftheorgansincludingliver,kidneys,adrenals, spleen,brain,heart,uterusandtestes/ovarieswererecorded.Therelative organweightofeachanimalwasthencalculatedasfollows;

$$\text{Relative organ weight} = \frac{\text{Absolute organ weight (g)}}{\text{Body weight of rats on sacrifice day (g)}} \times 100$$

Histopathology:

Histopathologicalinvestigationofthevitalorganswasdone.Theorgan pieces(3-5µmthick)ofthehighestdoselevelof400mg/kgwerepreserved andwerefixedin10%formalinfor24handwashedinrunningwaterfor24h. Samplesweredehydratedinanautotechniconandthenclearedinbenzene toremoveabsolutealcohol.Embeddingwasdonebypassingthecleared samplesthroughthreecupscontainingmoltenparaffinat50°Candthenina cubical block of paraffin made by the "L" moulds. It was followed by microtomeandtheslideswerestainedwithHaematoxylin-eosin.

Theorgansincludedbrain,heart,kidneys,liverandlungsoftheanimals werepreservedtheyweresubjectedtohistopathologicalexamination.

Statistical analysis:

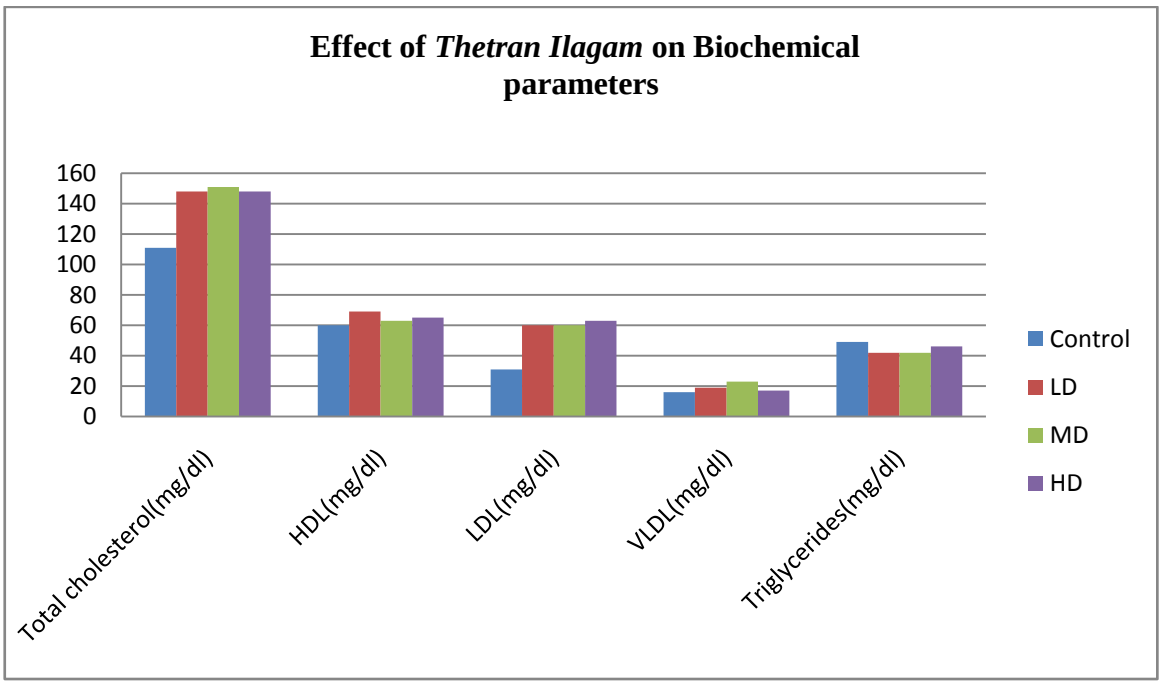
Findingssuchasclinicalsignsofintoxication,bodyweightchanges, foodconsumption,hematologyandbloodchemistryweresubjectedtoOne- way Anova. Followed by dunnet 't' test using a computer software programme.(GraphPadPrism5.0)

Repeated dose 90-days sub-chronic oral toxicity study of *Thetran Ilagam* on rats

Effect of *Thetran Ilagam* on Biochemical parameters

Dose (mg/kg)	Control	LD	MD	HD
Total cholesterol(mg/dl)	111.26±1.16	148.9±22.3	151.95±19.8	148.2±20.8
HDL(mg/dl)	60.5±4.08	69.1±12.8	63.16±5.40	65±10.8
LDL(mg/dl)	31.16±5.03	60±20.8	60.16±13.6	63±12.39
VLDL(mg/dl)	16.43±2.72	19.8±6.2	23.26±5.51	17.95±6.24
Triglycerides(mg/dl)	49.66±2.33	42.6±16.1	42.08±10.18	46.41±9.1

Values are mean± S.D. (Dunnett's test).*P<0.05,**P<0.01,N=12



Effect of *Thetran Ilagam* on Haematological Parameters

Parameter	Control	LD	MD	HD
RBC($\times 10^6$µl)	4.08±0.09	6.57±1.17	6.51±1.15	5.98±0.4
WBC($\times 10^3$µl)	8.93±0.48	10.01±2.7	9.91±2.1	9.84±1.7
PLT($\times 10^3$µl)	792.8±93.33	819.16±134.5	710.41±73.4	705.75±123.08
HGB(g/dl)	12.5±0.74	13.27±1.4	12.95±2.02	13.6±1.5
Neutrophils $10^3/mm^3$	2.01±0.47	2.78±0.71	2.65±0.84	2.30±0.67
Lymphocyte(%)	76.4±1.52	78.2±9.88	72.59±11.1	74.4±10.2
Monocyte(%)	3.18±0.11	2.69±0.61	3.41±1.09	3.6±0.95
Eosinophils(%)	1.3±0.15	1.44±0.21	1.36±0.23	1.42±0.18
Basophils(%)	0.66±0.51	0.25±0.45	0.25±0.62	0.5±0.52
MCH(pg)	20.95±1.0	20.2±1.96	18.4±3.1	19.10±2.7
MCV(fl)	62.06±2.65	61.39±7.7	60.55±7.22	62.9±6.7

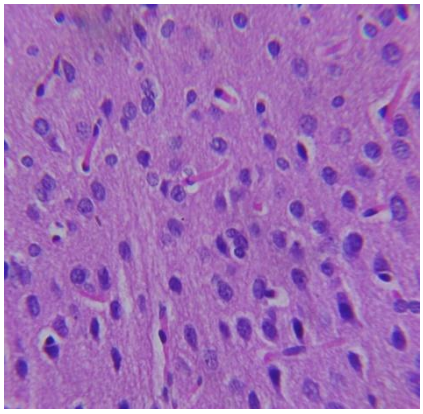
Values are mean± S.D. (Dunnett's test).*P<0.05,**P<0.01,N=12

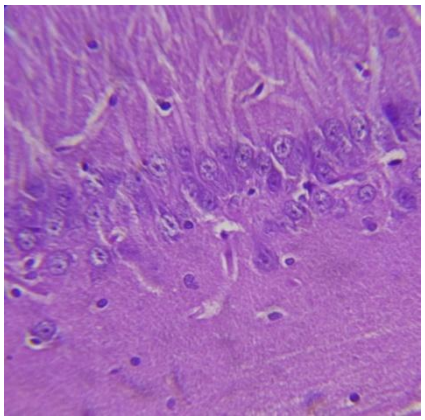
Dose	Relative Organ Weight of rats					
	Liver	**Kidney**	**Brain**	**Lungs**	**Heart**	**Spleen**
Control	2.8±0.1	0.66±0.02	0.38±0.22	0.29±0.01	0.29±0.01	0.15±0.01
900mg/kg	2.9±0.1	0.66±0.02	0.40±0.01	0.31±0.02	0.30±0.01	0.16±0.01
3600mg/kg	3.0±0.1	0.67±0.03	0.43±0.01	0.32±0.01	0.31±0.01	0.17±0.01

HISTOPATHOLOGICAL INVESTIGATION OF CONTROL AND AGC TREATED ANIMALS UNDER MAGNIFICATION POWER 40X FOR 90 DAYS LONG TERM TOXICITY STUDY:

BRAIN

CONTROL **HIGH DOSE**





CONTROL:

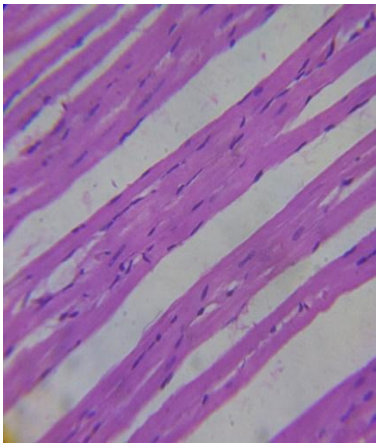
Arrangement of the neurons appears intact with no signs of degeneration or apoptotic changes in both the sample so cortex region showed normal neurons with polygonal to round cell bodies containing dense cytoplasm.

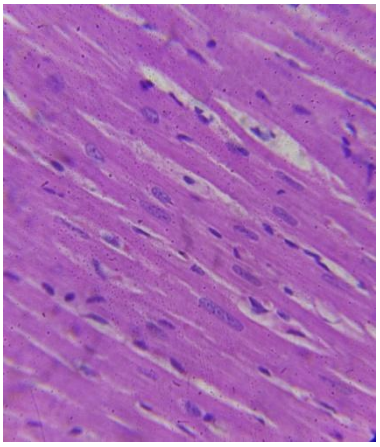
HIGH DOSE:

Appearance of Hippocampal neurons was normal with dense network o No signs of ischemic changes in the cerebral hemisphere

HEART

CONTROL **HIGH DOSE**





CONTROL:

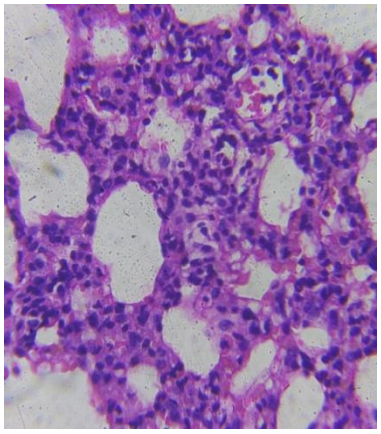
- Perfectly -arranged myocardial fibers, clear transverse striation and normal structure were observed.
- Appearance of cardiomyocyte was normal with dark nuclear region. The nuclei of muscle fibers appear oval arrangement

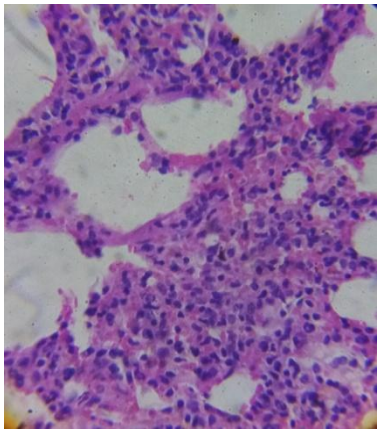
HIGH DOSE:

- Myocardial cells appears normal with well-defined mycoplasma and prominent nucleus and nucleolus

LUNGS

CONTROL **HIGH DOSE**





LUNGS:

CONTROL:

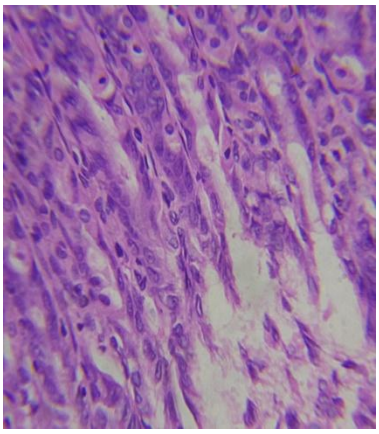
- Bronchial opening appears regular with no signs of infiltration
- Appearance of alveolar network was normal
- Nucleus of type I and II alveolar cells looks normal

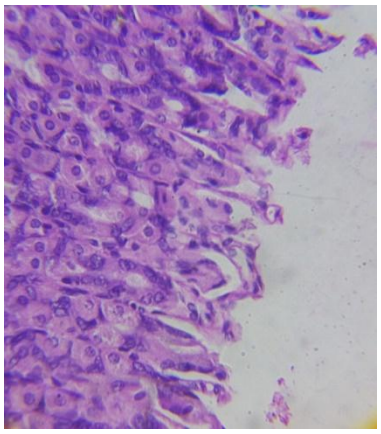
HIGH DOSE:

- Perivascular region appears normal, Alveolar septa and wall appeared widen and normal
- No signs of lymphocyte cuffing

STOMACH

CONTROL **HIGH DOSE**





STOMACH:

CONTROL:

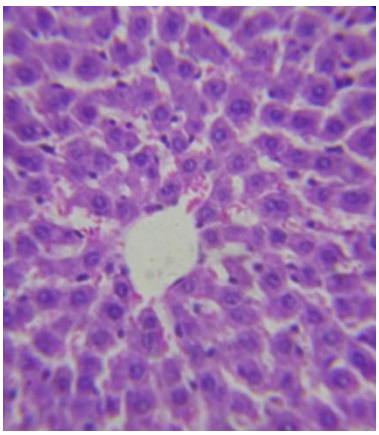
- Gastric glands, gastric glands including secretary sheath appears normal
- Normal gastric mucosa containing intact gastric gland cells, parietal cells which are spherical cell with deeply stained dark nucleus

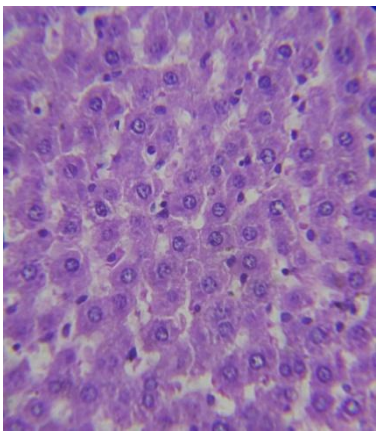
HIGH DOSE:

- No signs of ulcer and glandular degeneration were observed
- Appearance of Sub-mucosa and gastric glands appear normal

LIVER

CONTROL **HIGH DOSE**





LIVER:

CONTROL:

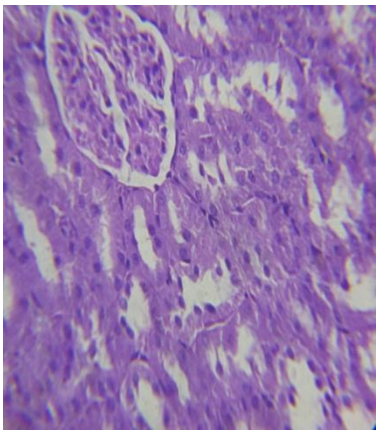
- Rare appearance of Kupffer cells with no evidence of phagocytosis in intracytoplasmic region
- Liver parenchyma appears normal with no evidence of necrosis
- Appearance of terminal hepatic venules (central veins) to the portal tracts was normal

HIGH DOSE:

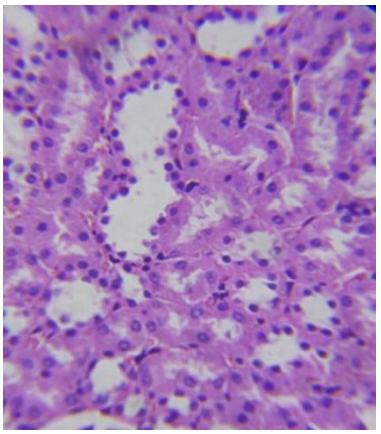
- Apparent loss of liver parenchyma were observed
- Increase distant of liver sinusoids were observed
- Occasional presence of Kupffer cells with no evidence of phagocytosis in intracytoplasmic region

KIDNEY

CONTROL



HIGH DOSE



KIDNEY:

CONTROL:

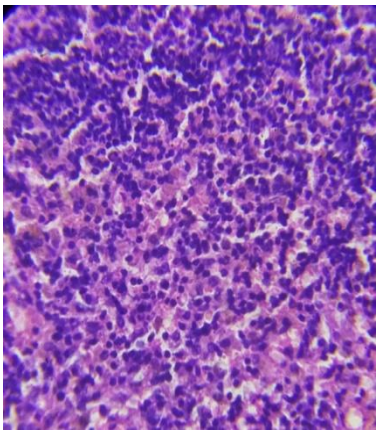
- Appearance of Podocytes and parietal epithelium in the glomeruli appears normal
- Proximal and distal convoluted tubule appears normal
- No signs of lesion or inflammation were observed
- No signs of cellular necrosis

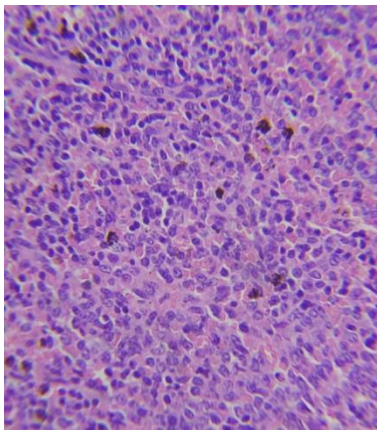
HIGH DOSE:

- Some renal tubules appears hypertrophic
- Appearance of Podocytes and parietal epithelium in the glomeruli appears normal

SPLEEN

CONTROL **HIGH DOSE**





SPLEEN:

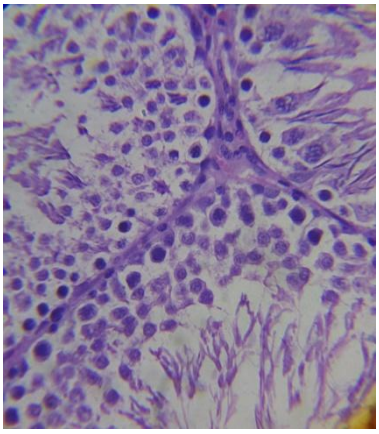
CONTROL:

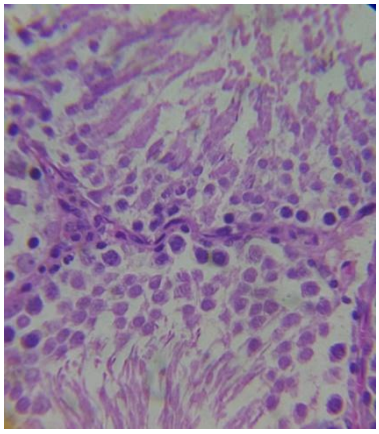
- No signs of perivascular inflammation
- Appearance of splenic sinuses, Splenic cord and endothelial orientation was normal
- Appearance of LF – lymphoid follicle; PALS – periarterial lymphoid sheath was normal with no significant signs of enlargement

HIGH DOSE:

- Marginal vascular zone radiated in between red and white pulp
- Appearance of splenic red pulp was normal

CONTROL **TESTIS** **HIGH DOSE**





TESTES:

CONTROL:

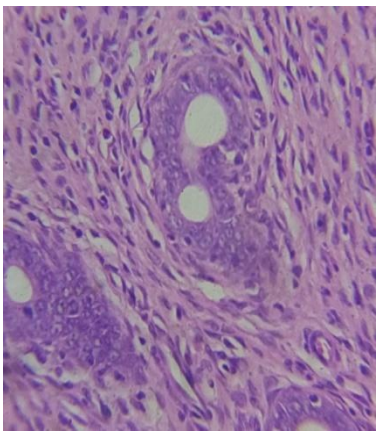
- Histocytology of testicular tissue shows well differentiated germ cells with respect of spermatogonia includes spermatid and sperm were observed
- Appearance of leydig cells, interstitial tissue, seminiferous tubule, Sertoli cells and spermatogonia were normal

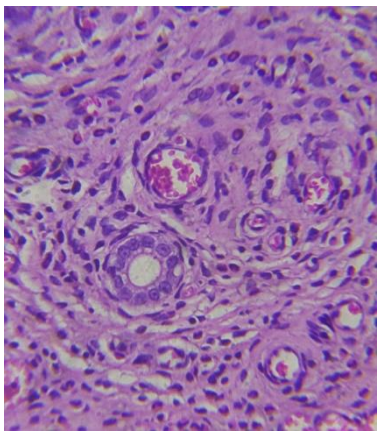
HIGH DOSE:

- Histo cytology of testicular tissue shows well differentiated germ cells with respect of spermatogonia includes spermatid and sperm were observed
- Appearance of leydig cells, interstitial tissue , seminiferous tubule, Sertoli cells And spermatogonia were normal

UTERUS

CONTROL **HIGHDOSE**





CONTROL:

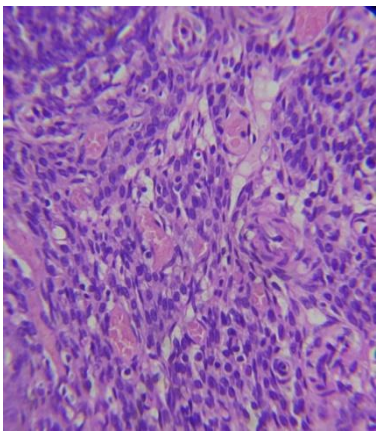
- Appearance of endometrium, myometrium and uterine glands was normal.

HIGH DOSE:

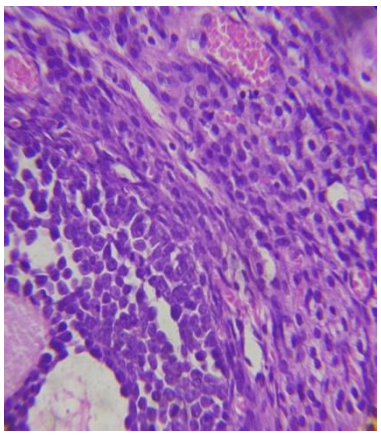
- Appearance of endometrium, myometrium and uterine glands was normal

OVARY

CONTROL



HIGHDOSE



OVARY:

CONTROL:

- Histopathological analysis of ovary showing normal corpus luteum (CL) and primordial follicles with few mature ovarian follicles with no signs of abnormality.

HIGH DOSE:

- Appearance of antral follicle, primary oocyte and secondary follicles are normal

DISCUSSION

Oral toxicity evaluation using a 90-days toxicity test is an accustomed practice in a Repeated dose 90-days sub-chronic oral toxicity study. Repeated dose 90-days sub-chronic oral toxicity studyhas been advocated as a fundamental test for assessing safety and has been applied previously in many safety assessment studies. In this report, we have first indicated that no dose-related toxicity effect was observed and the biochemistry parameters all fell within the reference range.

Although the body weights were increased during breed period, there were no significant different ($P > 0.05$) of body weights in male and female rats or between treatment and control groups. The RBC and coagulation parameters did not show any biologically or statistically significant differences between rats treated or controls. However, slight decreases (but have no dose dependent effect) in lymphocytes and neutrophils were noted in rats treated while these data also fell within the reference values.

In hematological and biochemical examination, some parameters differed in male and female SB groups but neither of these appeared to be of toxicological significance as they were slightly upper or lower than those of the control groups

Furthermore no dose related histopathological changes were observed. Gross examination in necropsy and at microscopic examination revealed no changes that attribute to the administration of drug.

Compared with concurrent controls, rats fed with *Thetran Ilagam*showed slight changes in some clinical chemistry and hematology values at various dosages but these were not regarded to represent adverse effects of the test substance because these values fell within the reference values besides lower cholesterol and triglyceride values. ALT and AST are important serum enzymes in the human liver and usually helps detect chronic liver diseases by monitoring theirconcentrations.

In the present study, results showed that the concentration of ALT and AST maintained regardless if the rats were fed with SB or without in treatment or control groups. The organ-to-weight ratio is one of the fundamental judgments to diagnose whether the organ exposed to the injury or not. Impaired organ often have abnormal tumidity or atrophy. There were no significant different ($P > 0.05$) changes of organ-to-weight ratios in male and female rats or between treatment and control groups.

CONCLUSION

Treating Wister albino rats with *Thetran Ilagam*at levels of LD 900, MD1800 and HD 3600 mg/kg/day to male and female rats for 12 weeks did not cause death and was not associated with adverse effects in general condition, growth, body and organ weights, hematology and clinical chemistry values, nor did it cause abnormalities in necropsy and histopathology findings. According to these results, *Thetran Ilagam* could be categorized as no-observed-adverse-effect level (NOAEL) drug as it acts harmlessly under the current normal usage and this phenomenon is considered to be of no toxicological concern. The dosage 900,1800 and 3600 mg/kg /day to rats under the conditions of this study. This study is first to investigate the toxicity of *Thetran Ilagam*in rats in a 90-daysRepeated dose sub-chronic oral toxicity studytrial and offer useful scientificknowledge.

Reference:

1. Schlede E., Mischke U., Diener W. and Kayser D. The International Validation Study of the Acute-Toxic-Class Method (oral). Arch. Toxicol. 1994;69, 659-670
2. Schlede E., Mischke U., Roll R. and Kayser D. A National Validation Study of the Acute-Toxic-Class Method – an alternative to the LD50 test. Arch. Toxicol. 1992;66:455-470.

ANNEXURE VI

STATISTICALANALYSIS

STATISTICAL ANALYSIS

All collected data were entered into MS Excel software using different columns as variable and rows as patients.SPSS software was used to perform statistical analysis.Basic descriptive statistics include frequency distributions and cross-tabulations were performed.The quantity variable were expressed as Mean ± Standard Deviation and qualitative data as percentage.A probability value of <0.05 was considered to indicate as statistical singnificance .Paired "t"test was performed for determining the significance between before and after treatment.

Paired Sample Statistics (Group –I Medicine only) before and after treatment

Semen analysis	Mean± SD	t Value	P Value
Before treatment	12.8 ± 7.06064	9.069	< 0.0001
After treatment	38.85±19.46461		

The mean± standard deviation of Group I Patients Semen Analysis at before and after treatment were 12.8 ± 7.0and 38.85±19.46respectively which is statistically significant (t=9.069, p=0.0001).

Sexual Health Score	Mean ± SD	t Value	P Value
Before treatment	6.3± 2.05452	6.8418	< 0.0001
After treatment	8.4±1.729009		

The mean± standard deviation of Group I Patients Sexual Health Score (SHC) at before and after treatment were 6.3± 2.05452 and 8.4±1.729009respectively which is statistically significant (t=6.8418, p=0.0001).

Paired Sample Statistics (Group –II Medicine along with Yogamtherapy) before and after treatment

Semen analysis	Mean± SD	t Value	p Value
Before treatment	12.8 ±7.06064	5.4025	< 0.0001
After treatment	38.85±19.46461		

The mean± standard deviation of Group II Patients Semen Analysis at before and after treatment were 12.8 ±7.06064and 8.4±38.85± 19.46461respectively which is statistically extremely significant (t=5.4025, p=0.0001).

Sexual Health Socre	Mean± SD	t Value	p Value
Before treatment	6.15±1.531253	12.1529	< 0.0001
After treatment	10.7±1.454575		

The mean± standard deviation of Group II Patients Sexual Health Score (SHC) at before and after treatment were 6.15±1.531253and 8.4±10.7±1.454575respectively which is statistically extremely significant (t=12.1529, p=0.0001).

No.of Patients 40	Mean ± SD	t Value	p Value
Before treatment	13.275 ± 7.146767	8.9348	<0.0001
After treatment	46.825 ±23.22011		

ANNEXURE VII

CONSENT FORM

ANNEXURE -VII

NATIONAL INSTITUTE OF SIDDHA
AYOTHIDASS PANDITHAR HOSPITAL
TAMBARAM SANATORIUM CHENNAI-47

Pre clinical and comparative Clinical trial of Thetran Ilagam in the Management of Aan Maladu (Male Infertility)

CONSENT FORM

"I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have asked have been answered to my satisfaction.

I consent voluntarily to participate in this study and understand that I have the right to withdraw from the study at any time without in any way it affecting my further medical care".

"I have received a copy of the information sheet/consent form".

Date:

Signature of the participant:

In case of illiterate participant

"I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely."

Date:

Signature ofa witness Left thumb Impression of the Participant

(Selected by the participant bearing no connection with the surveyteam)

Date:

Station:

Signature of participant:

Signature oftheGuide: Signature of thePrincipal Investigator:

தேசிய சித்த மருத்துவ நிறுவனம்

தாம்பரம் சாணடொரியம் ,சென்னை-47
அயொத்திதாஸ் பண்டிதர் மருத்துவமனை

ஆண் மலடு நோய்க்கான சித்த மருந்தின் (தேற்றான் இளகம்)

பரிகரிப்புத் திறனைக் கண்டறியும் மருத்துவ ஆய்விற்கான தகவல் படிவம்.

ஒப்புதல் படிவம்

ஆய்வாளரால் சான்றளிக்கப்பட்டது

நான் இந்த ஆய்வை குறித்த அனைத்து விபரங்களையும் நோயாளிக்கு புரியும் வகையில் எடுத்துரைத்தேன் என உறுதியளிக்கிறேன்.

தேதி: **கையொப்பம்:**

இடம்: **பெயர்** :

நோயாளியின் ஒப்புதல்

என்னிடம் இந்த மருத்துவ ஆய்வின் காரணத்தையும், மருந்தின் தன்மை மற்றும் மருத்துவ வழிமுறை பற்றியும், தொடர்ந்து எனது உடல் இயக்கத்தை கண்காணிக்கவும், அதனை பாதுகாக்கவும் பயன்படும் மருத்துவ ஆய்வுக்கூட பரிசோதனைகள் பற்றி திருப்தி அளிக்கும் வகையில் ஆய்வு மருத்துவரால் விளக்கிக் கூறப்பட்டது.

நான் இந்த மருத்துவ ஆய்வின் போது, காரணம் எதுவும் கூறாமல், எப்பொழுது வேண்டுமானாலும் இந்த ஆய்விலிருந்து என்னை விடுவித்து கொள்ளும் உரிமையை தெரிந்திருக்கின்றேன். நான் என்னுடைய சுதந்திரமாக தேர்வு செய்யும் உரிமையைக் தேற்றான் இளகம் ஆண் மலடு நோய்க்கான
மருந்தின் பரிகரிப்புத் திறனைக்
கண்டறியும் மருத்துவ ஆய்விற்கு என்னை உட்படுத்த ஒப்புதல் அளிக்கிறேன்.

தேதி : **கையொப்பம் :**

இடம் : **பெயர்** :

:

தேதி : **சாட்சிக்காரர் கையொப்பம் :**

இடம் : **பெயர்**

உறவுமுறை :

துறைத்தலைவர் கையொப்பம் : **ஆராய்ச்சியாளர் கையொப்பம்**

ANNEXURE VIII

CASE SHEET PROFORMA

ANNEXURE -VIII

NATIONAL INSTITUTE OF SIDDHA
AYOTHIDOSS PANDITHAR HOSPITAL, CHENNAI – 600 047.

DEPARTMENT OF SIRAPPU MARUTHUVAM

AN OPEN CLINICAL TRIAL OF SIDDHA DRUG ***"THETRAN ILAGAM"*** (INTERNAL) AND ***"YOGAM THERAPY"*** IN THE TREATMENT OF ***"AANMALADU"*** (MALE INFERTILITY)

Principal Investigator: Dr.S.Karthik Nagarajan

FORM I - SCREENING & SELECTION PROFORMA

1.SERIAL NO: …… **2. OP /IP NO: ……**
3.NAME: …… **4. AGE/GENDER: …….....**
5.OCCUPATION: …… **6.INCOME: ……**

INCLUSION CRITERIA

Male who doesn't have chance of conception for 1 year after Marriage with frequent unprotected sexual intercourse. YES\ NO
Age :24-50yrs YES\ NO
Sperm count ≤20 million/ml YES\ NO
Motility ≤50% YES\ NO
Patient willing to undergo Semen analysis &Routine blood investigation before and after treatment YES\ NO
Willing to participate in trial and signing consent by fulfilling the condition of proforma. YES\ NO

EXCLUSION CRITERIA

Azoospermia YES\ NO
Diabetic mellitus YES\ NO
VD&STD YES\ NO
Inguinal Hernia YES\ NO
Vericocele YES\ NO
Renal failure YES\ NO
Cardiac disease YES\ NO

YES ☐ NO ☐
If Yes, OPD ☐ IPD ☐
Serial NO: ☐☐

Date:
Station:
Signature of the Investigator
Signature of the Lecturer: **Signature of the HOD**

NATIONAL INSTITUTE OF SIDDHA
AYOTHIDOSS PANDITHAR HOSPITAL, CHENNAI – 600 047.

DEPARTMENT OF SIRAPPU MARUTHUVAM

AN OPEN CLINICAL TRIAL OF SIDDHA DRUGS ***"THETRAN ILAGAM"*** (INTERNAL)***YOGAM THERAPY***

IN THE TREATMENT OF ***"AANMALADU"(****MALE INFERTILITY)*

Principal Investigator: Dr.S.KARTHIK NAGARAJAN

FORM II--HISTORY TAKING PROFORMA

STUDY NO: **OP / IP NO:**
NAME: **AGE / GENDER:**
ADDRESS: **CONTACT NO :**
RELIGION : H / C / M / O.
OCCUPATION: **INCOME:**
MARITAL STATUS : Married
DATE OF INTIAL ASSESSMENT:
COMPLAINTS & DURATION:

PERSONAL HISTORY:

PERSONAL HABITS	YES	NO	IF YES SPECIFY DURATION	AMOUNT/Qty
Smoking				
Tobacco Chewing				
Alcohol				
Narcotic Drug Addiction				
Working in Hot Atmospere				

HISTORY OF PREVIOUS ILLNESS AND TREATMENT TAKEN:

Past how many years you got married?

1. Yes 2. No
1._____
2._____

III.SEXUAL HISTORY
Do you have trouble getting an erection? Yes No
Do you have trouble maintaining an erection?
Yes No Do you have trouble with ejaculations? Yes No If yes,____Premature ejaculations
____Retrograde ejaculations Do you have any abnormal discharge from your penis? Yes /No How

many times per week do you and your partner have intercourse?_____
How many times do you have intercourse around ovulation?_____
Have you recently noticed a change in your sexual drive? Yes/no Have you had an injury or abnormality to your penis,testicles or prostate? Yes No If yes,when? _____ Outcome/result_____
IV.FAMILY HISTORY Is there a history of hormonal disorders in your family? Yes No If yes,who and what type?_____
Is there a family history of Cystic Fibrosis Yes No If yes,whom:_____ Tay Sachs Disease Yes No If yes,whom:_____ Sickle Cell Anemia Yes No If yes,whom:_____
V.INFERTILITY HISTORY/TREATMENT
Have you ever been treated for infertility before? Yes No If yes,who was your physician?_____
What cause of infertility was diagnosed?_____ Is your partner currently seeing a doctor for evaluation of infertility? Yes No If yes,specify physician name and location._____
Which of the following tests have you had performed? Check all that apply and results. ____Semen Analysis When?_____ Results:_____

DIETARY STYLE:

1. Vegetarian 2. Non-vegetarian

Date:

Station:

Signature of the Investigator:

Signature of the Lecturer: **Signature of the HOD**

FORM II B

GENERAL EXAMINATION:

1. Body weight [Kg]	:		
2. Height [cms]	:		
3. Body Temperature [F]	:		
4. Blood Pressure (mm/Hg)	:		
5. Pulse Rate /min.	:		
6. Heart Rate / min.	:		
7. Respiratory Rate /min.	:		
		Yes	**No**
8. Pallor	:	☐	☐
9. Jaundice	:	☐	☐
10. Clubbing	:	☐	☐
11. Cyanosis	:	☐	☐
12. Pedal Oedema	:	☐	☐
13. Lymphadenopathy	:	☐	☐
14. Jugular venous pulsation	:	☐	☐

SYSTEMIC EXAMINATION

Cardiovascular system :
Respiratory system :
Gastro-intestinal system :
Central Nervous system :
Urogenital system :
Endocrine system :

SIDDHA SYSTEM OF EXAMINATION

1. THEGI (BODY CONSTITUTION):

1. Vathaudal ☐
2. Pithaudal ☐

3. Kabaudal
4. Thonthaudal

2. NILAM (LAND WHERE THE PATIENT LIVED MOST):

1. Kurinji(Hilly terrain)
2. Mullai (Forest range)
3. Marutham (Plains)
4. Neithal (Coastal belt)
5. Paalai (Aridregion)

3. KAALAM:

1. Kaarkaalam (Aavani-Purattasi)
2. Koothirkaalam (Ippasi-Kaarthigai)
3. Munpanikaalam (Maargazhi-Thai)
4. Pinpanikaalam (Maasi-Panguni)
5. Ilavenilkaalam (Chithirai-Vaigasi)
6. Muthuvenilkaalam (Aani-Aadi)

4. GUNAM:

1. Sathuvam
2. Rasatham
3. Thamasam

If yesspecify:_____

Bowel habit : Regular
Constipation

Sleep : Good Disturbed
Insomnia

Presenceof anxiety : Yes No

FAMILY HISTORY:

- No. of abortions his wife had: Yes No
  - Cardiovasculardisease : Yes No
  - Tuberculosis : Yes No
  - Others : Yes No

Ifyesspecify :

HISTORY OF CONGENITAL ANOMALIES

Cryptorchidism : Yes No

Hypospadias : Yes No

DRUG HISTORY

Steroids : Yes No

Antidepressant : Yes No

GENERAL EXAMINATION

Physicalbuild : Lean Normal Obese

Bodyweight :

Temperature :

Pulserate :

Heartrate :

PALPATION

Size and Consistencyof testicles : Normal Abnormal

PORIPULANGAL (SENSORY ORGANS):

	Before treatment	**After treatment**
Mei (Skin)	Normal / Affected	Normal / Affected
Vai (Tongue)	Normal / Affected	Normal / Affected
Kann (Eye)	Normal / Affected	Normal / Affected
Mooku (Nose)	Normal / Affected	Normal / Affected
Sevi (Ear)	Normal / Affected	Normal / Affected

KANMENDRIYAM (MOTOR ORGANS) :

	Before treatment	**After treatment**
Kai	Normal /Affected	Normal /Affected
Kaal	Normal /Affected	Normal /Affected
Vai	Normal /Affected	Normal /Affected
Eruvai	Normal /Affected	Normal /Affected
Karuvai	Normal /Affected	Normal /Affected

7. KOSANGAL (SHEATH):

	Before treatment	**After treatment**
Annamayakosam	Normal /Affected	Normal /Affected
Pranamayakosam	Normal /Affected	Normal /Affected
Manomayakosam	Normal /Affected	Normal /Affected
Vignanamayakosam	Normal /Affected	Normal /Affected
Ananthamayakosam	Normal /Affected	Normal /Affected

8. SEVEN UDAL THAATHUKKAL (SEVEN SOMATIC COMPONENTS)

	Before treatment	**After treatment**
Saaram	Normal /Affected	Normal /Affected
Senneer	Normal /Affected	Normal /Affected
Oon	Normal /Affected	Normal /Affected
Kozhuppu	Normal /Affected	Normal /Affected
Enbu	Normal /Affected	Normal /Affected
Moolai	Normal /Affected	Normal /Affected
Sukkilam / Suronitham	Normal /Affected	Normal /Affected

9. UYIR THAATHUKKAL: [THREE HUMORS] (VALI/ AZHAL/ IYYAM)

A) VALI

	0th day	8th day	15th day	22nd day	29th day	36th day	43rd day	49th day
Praanan								
Abaanan								
Samaanan								
Udhaanan								
Viyaanan								
Naagan								
Koorman								
Kirukaran								
Devathathan								
Dhananjeyan								

B) AZHAL

	0th day	8th day	15th day	22nd day	29th day	36th day	43rd day	49th day
Analakam								
Ranjakam								
Saathakam								
Prasakam								
Aalosakam								

IYYAM

	0th day	8th day	15th day	22nd day	29th day	36th day	43rd day	49th day
Avalambagam								
Kilethagam								
Pothagam								
Tharpagam								
Santhigam								

10. ENVAGAI THERVU: [EIGHT TYPES OF EXAMINATION]

I. NAADI: [PULSE PERCEPTION]

NAADI	0th day	8th day	15th day	22nd day	29th day	36th day	43rd day	45th day

II. SPARISAM: [PALPATION]

Day	SPARISAM
0th day	
8th day	
15th day	
22nd day	
29th day	
36th day	
43rd day	
49th day	

III. NAA: [TONGUE]

NAA	0th day	8th day	15th day	22nd day	29th day	36th day	43rd day	49th day

IV.NIRAM: [COMPLEXION]

1. Vadham ☐
2. Pitham ☐
3. Kabam ☐

V.MOZHI: [VOICE]

1. High Pitched ☐
2. Low Pitched ☐
3. Medium Pitched ☐

VI.VIZHI: [EYES]

VIZHI	0th day	8th day	15th day	22nd day	29th day	36th day	43rd day	49th day

VII. MALAM: [BOWEL HABITS / STOOLS]

	Before treatment	After treatment
Niram		
Irugal		
Ilagal		
Others		

VIII. MOOTHIRAM [URINE EXAMINATION]
NEERKKURI:

Neerkkuri	Before treatment	After treatment
Niram		
Manam		
Edai		
Nurai		

Enjal		

NEIKKURI:

Neikkuri	Before treatment	After treatment
Aravananeedathu/ Snake like pattern		
Azhipolparaviyathu Annular/Ringedpattern		
Muththothuninrathu Pearlbeadepattern		
Other patterns		

12. CLINICAL EXAMINATION:

Examination of Genital Organs: 16.Examinatiin of Male Genitalia

	Testis	Epididymis	Vas deferens	Varicocele	Hydrocele	Hernia
Right						
Left						

Examination of penis

Prepuce External urethral meatus Glans penis Body of penis

17. CLINICAL SYMPTOMS

S.no	CLINICAL SYMPTOMS	0th day	12th day	24th day	36th day	45th day
1	Premature ejaculation					
2	Nocturnal emission					
3	Erectile dysfunction					
4	Painful coitus					
5	Painful micuturition					

:

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DEPARTMENT OF SIRAPPU MARUTHUVAM

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Principal Investigator: Dr.S.KARTHIK NAGARAJAN

FORM -III CLINICAL ASSESSMENT DURING & AFTER TRIAL

1.OP/ IP NO: …… 2. SL. NO: …… 3.NAME: …….

4. AGE: …… 5. GENDER: ….. 6. DATE OF RECRUITMENT: ……

1. SEMEN ANALYSIS :

Volume:
Colour :
pH:
Viscosity:
Liquefaction time:
Motility:
Viability: For counting viable sperms eosin stain was used in laboratory.
Gradation of Sperm count:
Severe Oligozoospermia
Moderate Oligozoospermia
Mild Oligozoospermia
Morphological evaluation:

Testosterone level=

Date:

Station:

Signature of the Investigator:

Signature of the Lecturer: **Signature of the HOD**

FORM- III-A
SEXUAL HEATH SCORE

Sexual desire	SCORE
No desire at all	0
Lack of desire	1
Desire but no activity	2
Desire only on demand of the partner	3
Normal desire	4
Excess desire	5

ERECTION

No erection by any methods	0
Erection with artificial methods	1
Erection but unable to penetrate	2
Initial difficulty but able to penetrate	3
Erection with occasional failure	4
Erection when ever desired	5

RIGIDITY

Unable to maintain erection or unable to continue sexual act	0
Some case in erection but able to continue	1
Sexual act to maintain erection and continue sexual act	2

EJACULATION

No ejaculation at all	0
Delayed ejaculation without orgasm	1
Ejaculation before penetration	2
Ejaculation with penetration but early	3
Discharge ejaculation with own satisfaction	4
Ejaculation with own and partner's satisfaction	5

ORGASM

No ejaculation at all	0
Lack of enjoyment in most of occasions	1
Enjoyment in 25% of sexual encounters	2
Enjoyment in 50% of sexual act	3
Enjoyment in 75% of sexual act	4
Enjoyment in every sex act	5

FORM- III-B

YOGAM THERAPY

SERIAL NO:

NAME OF THE ASANAM:

1.Araimachchenthira asanam

2.Machasanam(meenasanam)

3.Mahamutra

4.Sarvaangasanam(muzhu udal asanam)

5.Shalabhasanam(Vittil asanam)

6.Dhanurasanam(Vizlasanam)

7.Pachimothasanam(Thalai muzhangaal asanam)

8.Pranayamam(Sarapayirchi or Moochu payirchi)

9.Shanthiasanam(Savasanam)

Day	Date	Morning	Evening
Day 0			
Day 8			
Day 15			
Day 22			
Day 29			
Day 36			
Day 41			
Day 45			

Date:

Station:

Signature of the Investigator:

Signature of the Lecturer: **Signature of the H.O.D**

MOOTHIRAM

1. Neerkuri

Niram :

Manam :

Edai :

Nurai :

Enjal :

2. Neikuri

SIGNS AND SYMPTOMS:

S.No	Clinical Features	Before Treatment	During Treatment of every 7days							
1.	Premature ejaculation									
2.	Erectile dysfunction									
3.	Painful coitus									
4.	Nocturnal emission									
5.	Burning micturition									

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Principal Investigator: Dr.S.KARTHIK NAGARAJAN

FORM-IV - LABORATORY INVESTIGATIONS

BLOOD INVESTIGATIONS		NORMAL VALUES	BEFORE TMT (DATE)	AFTER TMT (DATE)
Hb (gm/dl)		**M:12-15 W:11.5-12**		
T.WBC (cells/cu.mm)		**4000-11000**		
DIFFERENTIAL COUNT (%)	**Polymorphs**	**40-75**		
	Lymphocytes	**20-40**		
	Monocytes	**2-10**		
	Eosinophils	**1-6**		
	Basophils	**0-1**		
T.RBC (million cells / cu.mm)		**M:4.0-5.5 W:3.5-4.5**		
ESR (mm/hour)	**½ hr.**	**M:6-12 W:7-18**		
	1 hr.			
Blood glucose (mg/dl)	**Fasting**	**70-110**		
	PP	**80-140**		
	Random	**80-120**		
RFT (mg/dl)	**Blood urea**	**16-50**		
	Serum Creatinine	**0.6-1.2**		
LFT (mg/dl)	**Total bilirubin**	**0.2-1.2**		
	Direct bilirubin	**0.1-1.2**		
	Indirect bilirubin	**0.2-0.7**		
	SGOT	**0-40**		
	SGPT	**0-35**		
	Alkaline phosphatase	**80-290**		

SPECIFIC INVESTIGATION

SEMEN ANALYSIS –

Volume

Colour

Appearance

Viscosity

Liquification time

Fructose

Sperm count

Motility

Morphology

Testosterone level=

URINE INVESTIGATION	BEFORE TMT(DATE)	AFTER TMT (DATE)
Albumin		
Fasting sugar		
PP sugar		
Deposits		

Date:

Station:

Signature of the Investigator:

Signature of the Lecturer: **Signature of the HOD**

NATIONAL INSTITUTE OF SIDDHA
AYOTHIDOSS PANDITHAR HOSPITAL, CHENNAI – 600 047.

DEPARTMENT OF SIRAPPU MARUTHUVAM

. **AN OPEN CLINICAL TRIAL OF SIDDHA DRUGS *"THETRAN ILAGAM"* (INTERNAL) AND YOGAM THERAPY IN THE TREATMENT OF *"AANMALADU (MALE INFERTILITY)***

FORM-V– INFORMATION SHEET

Name of Principal Investigator : Dr.S.KARTHIK NAGARAJAN
Name of the institute : National Institute of Siddha,
Tambaram Sanatorium,
Chennai-47.

INFORMATION SHEET FOR PATIENTS PARTICIPATING IN THE OPEN CLINICAL TRIAL:

I, Dr.S.KARTHIK NAGARAJAN Studying as M.D(Siddha) at National Institute of Siddha, Tambaram Sanatorium is doing a trial on the study AANMALADU (MALE INFERTILITY) MALE INFERTILITY is a most common disease in now a days, occurring throughout the world. In this regard, I am in a need to ask you few questions. I will maintain confidentiality of your comments and data obtained. There will be no risk of disclosing your identity and no physical, psychological or professional risk is involved by taking part in this study. Taking part in this study is voluntary. No compensation will be paid to you for taking part in this study.

You can choose not to take part. You can choose not to answer a specific question. There is no specific benefit for you if you take part in the study. However, taking part in the study may be of benefit to the community, as it may help us to understand the problem of defaulters and potential solutions.

If you agree to be a participant in this study, you will be included in the study primarily by signing the consent form and then you will be given the internal medicine Thetran lehiyam (Internal medicine-5gm, Twice a Day with milk for 45 days) and yogam therapy, if you wish to stay in the In Patient ward Treatment will be provided to you assuring that you will not be definitely hurt in any course of treatment.

The information I am collecting in this study will remain between you and the principal investigator (myself).

If you wish to find out more about this study before taking part, you can ask me all the questions you want or contact Dr.S.Karthik Nagarajan, PG Scholar cum principal investigator of this study, attached to National Institute of Siddha, Chennai-47. You can also contact the Member-secretary of Ethics committee, National Institute Siddha,Chennai 600047, Tel no : 91-44-22380789, for rights and participation in the study.

FORM-V-தகவல் படிவம்

ஆண் மலடு என்னும் நோய்க்கு தேற்றான் லேகியம் (உள் மருந்து) மற்றும் **யோகம்** சித்த மருந்துகளின் பரிகரிப்புத் திறனைக் கண்டறியும் மருத்துவ ஆய்விற்கான தகவல் படிவம்.
முதன்மை ஆராய்ச்சியாளர் பெயர் : Dr. S.**கார்த்திக் நாகராஜன்**

நிறுவனத்தின் பெயர் : தேசிய சித்த மருத்துவ நிறுவனம்,

தாம்பரம் சானட்டோரியம், சென்னை- 47.

தேசிய சித்த மருத்துவ நிறுவனத்தில் பட்ட மேற்படிப்பு பயின்று வரும் நான் ஆண் மலடுஎன்னும் நோயில் மருத்துவ ஆராய்ச்சியில் ஈடுபட்டுள்ளேன்.

ஆண் மலடு என்பது விந்தனுக்களின் எண்ணிக்கை குறைவு ,விந்து நீர்த்து போதல், இந்த ஆராய்ச்சி சம்மந்தமாக சில கேள்விகளை கேட்கவும், , தேவையான ஆய்வக பரிசோதனைக்கும் தங்களை உட்படுத்தவும் உள்ளேன்.

இந்த ஆராய்ச்சிக்கு தாங்கள் விருப்பத்தின் பேரில் உட்படும் பட்சத்தில்
உள்மருந்தாகதேற்றான்லேகியம்5கி அளவுஅனுபானத்தில் பால் 2 வேளை (காலை மாலை)
உணவுக்குப் பின் 45நாட்களுக்கு உட்கொள்ள வேண்டும். யோகம்45 நாட்களுக்கு பயிற்சி செய்தல் வேண்டும். .வெளி நோயாளர்கள் 7 நாட்களுக்கு ஒருமுறை மருத்துவமனைக்கு வரவேண்டும்.

இது சம்பந்தமான தங்களது அனைத்து விவரங்களும் ரகசியமாக வைக்கப்படும் என உறுதிஅளிக்கிறேன். இதில் பயணப்படி முதலிய எந்த உதவி தொகையும் வழங்கப்பட மாட்டாது.இந்த ஆராய்ச்சியின் போது உடலுக்கு வேறு பாதிப்பு ஏற்படும் பட்சத்தில் தேசிய சித்த மருத்துவமனையில் தக்க மாற்று சிகிச்சை அளிக்கப்படும்.இந்த ஆராய்ச்சியில் தங்களை உட்படுத்திய பிறகு உங்களுக்கு விருப்பமில்லையெனில் எப்போது வேண்டுமானாலும் விலகி கொள்ள முழு உரிமை உள்ளது

இந்த ஆராய்ச்சி சம்பந்தமாக மற்ற விபரங்களுக்கும் நோயின் தன்மை பற்றியும் முதன்மை ஆராய்ச்சியாளரான Dr. S.கார்த்திக் நாகராஜன் பட்ட மேற் படிப்பாளர் சிறப்புமருத்துவ பிரிவு அணுகவும். கைப்பேசி எண்:
மேலும் இந்த ஆராய்ச்சிக்கு IEC சான்று பெறப்பட்டுள்ளது.

இந்த மருந்து ஆண் மலடு நோய்க்காக சித்த மருத்துவத்தில் கூறப்பட்டுள்ளது. ஏற்கனவே உபயோகத்தில் உள்ள இது போன்ற மருந்து இதுவரை நோயாளிகளிடம் எந்தவித பக்க விளைவுகளையும் ஏற்படுத்தவில்லை. மேலும் உணவு முறையில் கத்தரி, பாகல், கரப்பான் பண்டங்கள், உப்பு, புளிப்பு முதலியவைகளை தவிர்த்து பத்தியம் காக்குமாறு அறிவுறுத்தப்படுகிறது

NATIONAL INSTITUTE OF SIDDHA
AYOTHIDOSS PANDITHAR HOSPITAL, CHENNAI – 600 047.

DEPARTMENT OF SIRAPPU MARUTHUVAM

. AN OPEN CLINICAL TRIAL OF SIDDHA DRUGS *"THETRAN ILAGAM"* (INTERNAL) AND "*YOGAM THERAPY* IN THE TREATMENT OF *AANMALADUI"* (MALE INFERTILITY)

Name of Principal Investigator: Dr.S.KARTHIK NAGARAJAN

FORM –IV- DRUG COMPLIANCE FORM

SERIAL NO:

NAME:

DRUG NAME:

On 1st day-Date: Drugs issued: (Gms) Drugs returned: (Gms)
On 8th day-Date: Drugs issued: (Gms) Drugs returned: (Gms)
On 15th day-Date: Drugs issued: (Gms) Drugs returned: (Gms)
On 22th day-Date: Drugs issued: (Gms) Drugs returned: (Gms)
On 29th day-Date: Drugs issued: (Gms) Drugs returned: (Gms)
On 36th day-Date: Drugs issued: (Gms) Drugs returned: (Gms)
On 42th day-Date: Drugs issued: (Gms) Drugs returned: (Gms)
On 45th day Date Drugs issued: (Gms) Drugs returned: (Gms)

Day	Date	Morning	Evening	Day	Date	Morning	Evening
Day 1				Day25			
Day2				Day26			
Day3				Day27			
Day4				Day28			
Day5				Day29			
Day6				Day30			
Day7				Day31			
Day8				Day32			
Day9				Day33			
Day10				Day34			
Day11				Day35			
Day12				Day36			
Day13				Day37			
Day14				Day38			
Day15				Day39			
Day16				Day40			
Day17				Day41			

Day18				Day42			
Day19				Day43			
Day20				Day44			
Day21				Day45			
Day22							
Day23							
Day24							

Date:
Station:
Signature of the Investigator:
Signature of the Lecturer: **Signature of the HOD**

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.

Name of Principal Investigator: Dr.S.KARTHIK NAGARAJAN

FORM VII - WITHDRAWAL FORM

1. SERIAL NO OF THE CASE:

2. OP / IP NO:

3. NAME:

4. AGE:

5. GENDER:

6. DATE OF TRIAL COMMENCEMENT:

7. DATE OF WITHDRAWAL FROM TRIAL:

8. REASONS FOR WITHDRAWAL:

Long absence at reporting:	Yes/ No
Irregular treatment:	Yes/ No
Shift of locality:	Yes/No
Increase in severity of symptoms:	Yes/No
Development of severe adverse drug reactions:	Yes/No
Development of adverse event:	Yes/No

(If YES, give the details of adverse reaction in Form VII -B – Adverse Reaction Form / Pharmaco Vigilance Form)

Date:

Station:

Signature of the Investigator:

Signature of the Lecturer: **Signature of the HOD**

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Name of Principal Investigator: Dr.S.KARTHIK NAGARAJAN

FORM VII - A – ADVERSE REACTION FORM / PHARMACO VIGILANCE FORM

SERIAL NO:

OP/IP NO:

NAME: **AGE:** **GENDER:**

DATE OF TRIAL COMMENCEMENT:

DATE OF THE ADVERSE REACTION OCCUR:

DESCRIPTION OF ADVERSE REACTION:

Date:

Station:

Signature of the Investigator:

Signature of the Lecturer: **Signature of the HOD**

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Name of Principal Investigator:Dr.S.KARTHIK NAGARAJAN

FORM VIII – DIETARY ADVICE FORM

சேர்க்க கூடிய உணவுகள்	தவிர்க்க வேண்டியவைகள்
முருங்கைப்பிஞ்சு முருங்கை பூ முருங்கை காய் மாதுளை பழம் சின்ன வெங்காயம் அயிரை மீன் பூசணிகாய் ,விதை வாதுமை பருப்பு செவ்வாழை வெள்ளை பூண்டு கரிசாலை பொன்னாங்கண்ணி மணத்தக்காளி முருங்கைக்கீரை பசலைக்கீரை சிறுகீரை கறிவேப்பிலை கொத்தமல்லி மாதுளை ஆப்பிள் திராட்சை கொய்யா நாவல் சப்போட்டா உலர் திராட்சை வேகவைத்த காய்கறிகள் தர்பூசணி சோயாபீன்ஸ் பேரிச்சம் பழம் முந்திரி அத்திபழம்	கோழிக்கறி நண்டு கருவாடு முட்டை புளிப்புப் பொருள்கள் அன்னாசி எலுமிச்சை ஊறுகாய் பெண்போகம் புகையிலை மது அருந்துதல் இறுக்கமான உள்ளாடை தவிர்த்தல் மடிகணினி மடியில் வைத்து பயன்படுதுதல் இரவில் கண்விழிதல் அதிக காரம் அதிக உப்பு அதிக புளிப்பு தவிக்கவும்

BIBLIOGRAPHY

Reference:

1. Hakkim.P.M.Abdulla saayapuAnuboga vaithya navanetham (part-8) 2nd Edition,pg **143**
2. Mr. N. Kandasamy Pillai History of siddha medicine 2nd edition 1998, Pg1Mr. N. Kandasamy Pillai History of siddha medicine 2nd edition 1998, Pg 283 .http://www.indianmedicine.nic.in/index3.asp?sslid=196&subsublinkid=38&lang=1
3. "Siddha - Origin". CCRAS, Department of AYUSH, Indian Government. Retrieved 10 November 2011.
4. Master Murugan, Chillayah (20 October 2012). "Siddha Therapy, Natural Remedies and Self- Treatment".Varma Kalai. Retrieved 31 May2013.
5. "Herbs used in Siddha medicine for arthritis - A review". Indian Journal of Traditional Knowledge. October 2007. Retrieved 10 November2011.
6. Infecundity, infertility, and childlessness in developing countries. DHS Comparative Reports No 9.Calverton, Maryland, USA: ORC Macro and the World Health Organization; 2004. World HealthOrganization.
7. Sciarra J. Infertility: an international health problem. Int J Gynaecol Obstet. 1994;46:155–63.[PubMed]
8. Looking back, looking forward: a profile of sexual and reproductive health in India. New Delhi: Population Council; 2004. Population Council. Infertility; pp.67–72.
9. Cooper TG, Noonan E, Von Eckardstein S, Auger J, Baker HWG, Behre HM, Haugen TB, Kruger T, Wang C (2009). "World Health Organization reference values for human semen characteristics". Human Reproduction Update 16 (3): 231–45.doi:10.1093/humupd/dmp048. PMID19934213.
10. Jeffrey E. Saffitz, MD,PhD Alan L. Schiller, MD Rubin‟ s Pathology clinicopathologic foundations of medicine Published by Michael Tully seventh edition2015
11. S.P.Ramachandran, Thirumoolar Karukadai Vaithiyam 600, Thamarai Noolagam 2nd edition 1998, Pg14
12. S.P.Ramachandran, Thirumoolar Karukadai Vaithiyam 600, Thamarai Noolagam 2nd edition 1998 Pg 31
13. Dr.M.Shanmugavelu,H.B.I.M. Noi Nadal Noi Mudhal Nadal Thirattu,

Indian Medicine and Homeopathy, Fourth Edition 2006, Pg.30-34.

14. Dr.M.Shanmugavelu,H.B.I.M. Noi Nadal Noi Mudhal Nadal Thirattu, Indian Medicine and Homeopathy, Fourth Edition 2006, Pg.255-258.
15. Dr.M.Shanmugavelu,H.B.I.M. Noi Nadal Noi Mudhal Nadal Thirattu, Indian Medicine and Homeopathy, Fourth Edition 2006, Pg.255-258.
16. Dr.M.Shanmugavelu,H.B.I.M. Noi Nadal Noi Mudhal Nadal Thirattu, Indian Medicine and Homeopathy, Fourth Edition 2006, Pg.280-281.
17. Dr.M.Shanmugavelu,H.B.I.M. Noi Nadal NoiMudhalNadalThirattu, Indian Medicine and Homeopathy, Fourth Edition 2006, Pg.233-238.
18. Dr.M.Shanmugavelu,H.B.I.M. Noi Nadal Noi Mudhal Nadal Thirattu, Indian Medicine and Homeopathy, Fourth Edition 2006, Pg.270-271
19. Dr.M.Shanmugavelu,H.B.I.M. Noi Nadal Noi Mudhal Nadal Thirattu, Indian Medicine and Homeopathy, Fourth Edition 2006, Pg. 282
20. Ga.Manickavasagam, ThirumoolarThirumanthirammoolamum uariyum,uma publication 1st edition may 2003 pg211
21. Ga.Manickavasagam, ThirumoolarThirumanthirammoolamum uariyum,uma publication 1st edition may 2003 pg834
22. Ga.Manickavasagam, Thirumoolar Thirumanthiram moolamum uariyum,uma publication 1st edition may 2003 pg839
23. S.P.Ramachandran, Patheensiddhargal Padiya silaraikovai1pagam thamarai noolagam, 1st edition 1996 pg 25
24. Dr.K..S.Utthamaraiyan, Siddha Maruthuvanga Surukkam,Indian Medicine and Homeopathy dept., 3rd edition 2003, pg49
25. V.Balaramiah, The Greatness of Siddha Medicine, Aruljothi pathipagam arumbakkam, Chennai, pg11
26. Ayureveda Baskarar KandhasamyMudhaliyar,Athmarachamirtham ennum karpakol, B.Rathna nayakar and sons, 1st edition 29th july 1972, pg36
27. S.P.Ramachadran, Yugi vaithiya chindhamani 800, thamarai noolgam, 1st edition 1998,pg115
28. Dr.M.Shanmugavelu H.B.I.M Noi Nadal Noi Mudhal Nadal Thirattu, Indian Medicine and Homeopathy Dept.4th edition 2006, Pg574
29. Dr.M.Shanmugavelu H.B.I.M Noi Nadal Mudhal Nadal Thirattu, Indian Medicine and Homeopathy Dep 4th edition 2006, Pg 66
30. Dr.S.Perma, M.D.(S).,Agathiyar vaithiya chidhamani venba 4000, pagam 1,Thamarai noolgam, 2nd edition sep 2006, pg60

31. T.V.Sambasivampillai, Dicionary (tamil-english), The research institute of siddhars science 1st edition 1931,pg345
32. Dr.P.M.Venugopal H.P.I.M.,Udal thaththuvam,Indian Medicineand Homeopathy Dept.1st edition 1968, pg176
33. Dr.P.M.Venugopal H.P.I.M.,Udal thaththuvam,Indian Medicine and Homeopathy Dept.1st edition 1968, pg 337
34. Dr.P.M.Venugopal H.P.I.M.,Magalir maruthuvam, Indian Medicine and Homeopathy Dept.1st edition 1971, pg96
35. Dr.T.Mohanraj, Arivaiyar chinthamani, Ivans printers, 1st edition may 2008, pg153
36. T.Kannanrajaram, Varma Maruthuvam sirappu, ATSVS Siddha college, 1stedition 2007, pg260
37. T.Kannanrajaram, Varma Maruthuvam sirappu, ATSVS Siddha college, 1st edition 2007, pg80
38. T.Kannanrajaram, Varma Maruthuvam sirappu, ATSVS Siddha college, 1st edition 2007, pg283
39. T.Kannanrajaram, Varma Maruthuvam sirappu, ATSVS Siddha college, 1st edition 2007, pg243,372
40. T.Kannanrajaram, Varma Maruthuvam sirappu, ATSVS Siddha college, 1st edition 2007, pg299
41. T.Kannanrajaram, Varma Maruthuvam sirappu, ATSVS Siddha college, 1st edition 2007, pg239
42. T.Kannanrajaram, Varma Maruthuvam sirappu, ATSVS Siddha college, 1st edition 2007, pg381
43. Sivavakkiyar padal- moolaum uraiyam pg202
44. .Dr.R.Thiyagarajan, LIM, Theraiyar yamaga venba, Arulmigu palani Dhandayuthapani samy thirukovil maruthuvanool veliyitukuzhu, 1st edition 1976, pg65
45. R.C.Mohan,Pathieensidhar Naadi Sasthiram, Thamarai Noolagam, 1st edition 2012, pg89
46. S.P.Ramachadran, Theraiyar neerkuri neikuri nool moolamum uraiyam, thamarai noolgam, 1st edition 2000, pg2-3

47. Dr. S.Hema MBBS, Phd (Ysc)., Yoga for Health, Tara Yoga Publication, 1st edition dec 2003, pg23-94
48. B.K.S.Iyengar, Lighton Pranayama, Great Britain by George Allen&Unwin, 1st edition 1981, pg48-49
49. Pandit Shambhu Nath, Stress Management Yoga and Meditation, Sterling publisher, 1st edition 1992, pg94
50. K.S.Murugesa Mudhaliyar, Gunapadam Mooligai Vaguppu, Indian Medicine and Homeopathy Dept.2nd edition 2002, pg326
51. K.S.Murugesa Mudhaliyar, Gunapadam Mooligai Vaguppu, Indian Medicine and Homeopathy Dept.2nd edition 2002, pg536
52. K.S.Murugesa Mudhaliyar, Gunapadam Mooligai Vaguppu, Indian Medicine and Homeopathy Dept.2nd edition 2002, pg772
53. K.S.Murugesa Mudhaliyar, Gunapadam Mooligai Vaguppu, Indian Medicine and Homeopathy Dept.2nd edition 2002, pg500
54. K.S.Murugesa Mudhaliyar, Gunapadam Mooligai Vaguppu, Indian Medicine and Homeopathy Dept.2nd edition 2002, pg561
55. K.S.Murugesa Mudhaliyar, Gunapadam Mooligai Vaguppu, Indian Medicine and Homeopathy Dept.2nd edition 2002, pg576
56. K.S.Murugesa Mudhaliyar, Gunapadam Mooligai Vaguppu, Indian Medicine and Homeopathy Dept.2nd edition 2002, pg596
57. Dr.R.Thiyagarajan, LIM.,Siddha Maruthuvam Sirappu, Indian Medicine and Homeopathy Dept,3rd edition 2008, pg10
58. Dr.R.Thiyagarajan, LIM.,Siddha Maruthuvam Sirappu, Indian Medicine and Homeopathy Dept,3rd edition 2008, pg 19
59. Dr.K.Durairasan H.P.I.M.,Noi Illa Neri, Indian Medicine and Homeopathy Dept. 1st edition 1986, pg187-260
60. Sigman M, Lipshultz LI, Howards SS. Evaluation of the subfertile male. In: Lipshultz LI, Howards SS (eds). *Infertility in the male*. St. Louis, Missouri: Mosby-Year Book, 1997:173.
61. Zargar AH, Wani AI, Masoodi SR, Laway BA, Salahuddin M. Epidemiologic and etiologic aspects of primary infertility in the Kashmir region of India. *Fertil Steril*1997;68:637–43.
62. Irvine DS. Epidemiology and aetiology of male infertility. *Hum Reprod* 1998;13 (Suppl1):33–44.

63. Nalini K, Sethi BK, Sharma M, Dash RJ. Aetiologic factors in male infertility: Clinical, microbiological and hormonal evaluation. *J Assoc Physicians India* 1992;40:147–9.
64. Harsh Mohan, MD,MNAMS,FICPath,FUICC., Textbook of Pathology,Jaypee Brothers Medical Publication(P) Ltd, 6th edition2010, pg 704-705
65. B D Chaurasia, Human anatomy volume 2, Satish kumar jain for CBS publishers, 4th edition 2006, pg213-220
66. B D Chaurasia, Human anatomy volume 2, Satish kumar Jain for CBS publishers, 4th edition 2006, pg 369-376
67. K.Sembulingam, Phd.,Essentials of Medical Physiology, Jaypee Brothers Medical Publication(P) Ltd, 6th edition2013, pg455-472
68. S.P.Ramachandran, Agathiyar Paripooranam 400, Thamarai Noolagam,1st edition may 1998, pg104-105
69. Andrology,Male Reproductive Health and Dysfunction 3rd Edition, ISBN: 978-3-540-78354-1
70. Kamel R.M.Management of the infertile couple:an evidence –based protocol,Report Bio Endocrinol RBE,8(2010)21
71. Thirumanthiram A classic Yoga and Tantra,Mathinilayam,january2011
72. Dr.Asana Andiyappan,1 January 2016 Thirumoolar's Ashtanga yoga
73. World Health Organization: Report of the Meeting on the Prevention of Infertility at the Primary Health Care Level. WHO, Geneva 1983, WHO